Model Engineer

DECEMBER 1976

MAP HOBBY MAGAZINE 35p

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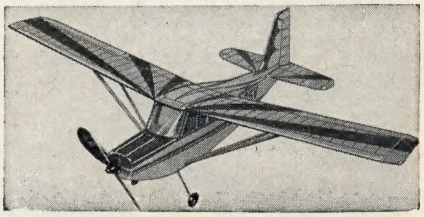

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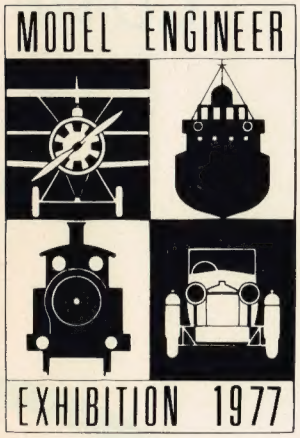

Hours of opening
Daily 10 a.m. - 8 p.m.
(January 15th: 10 a.m. - 7 p.m.)

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On the cover —
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A New Home

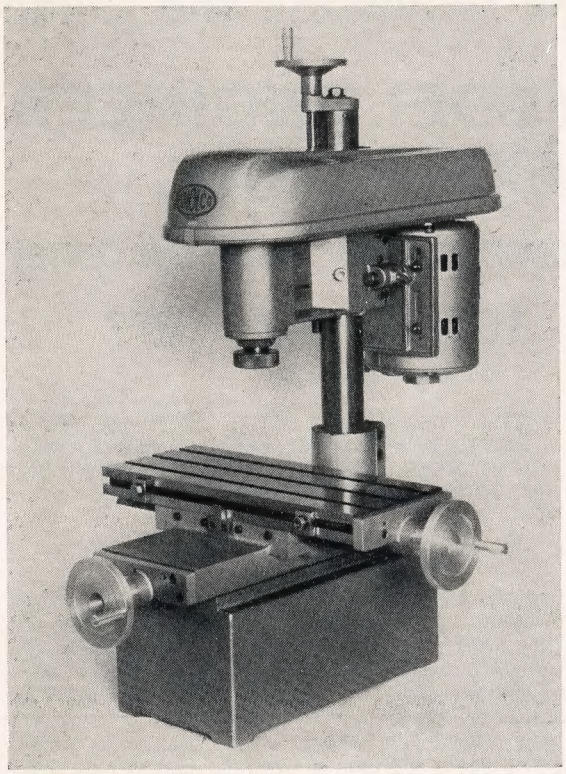
Visitors to Model Engineer Exhibitions over the last few years will in most cases have carried away a memory of crowds, especially those who could only make their visits on one of the Saturdays of the show. Our difficulty has been the lack of an available hall sufficiently large to allow us to spread a little, without going to an extreme. The answer has been provided in the form of the Wembley Conference Centre, a huge new complex incorporating a 2,700 seat theatre, smaller theatres or conference rooms, and display space affording us twice the area we have previously been able to use.

This exhibition will be the first open to the general public in the new building, and this has presented the organisers with occasional problems. We believe, however, that we shall be having a splendid show in almost luxurious surroundings, and the improvements we have been able to effect will more than outweigh any regrets at the change of venue. One factor alone — the vast car park capacity — will make life easier for visitors, who will be able to leave their cars all day for 50p, a much smaller cost than meter or other parking around our previous site.

This year we have lost the small swimming pool on which we have been able to demonstrate boats in action, but we have gained a number of small theatres in which programmes of films and lectures will be held daily. We have many more trade stands, most of which are model engineering, tool, or modelling suppliers, giving even better opportunities of doing a little shopping for items which are not so easily available in most towns.

Once again there is a Gem Craft section, which broadens horizons and is immensely popular with families, and this year, for the first time, we have a "show within a show" for the growing army of woodworking craftsmen, professional as well as amateur. As a source of tools and ideas this area of the lower floor will be unique, with skilled advice and specialist books and tools for all aspects of the craft of working in wood. There are many common interests between those who work in metal and those whose choice is wood, and we are sure that adding a new dimension in this way will increase the pleasure of all enthusiasts.

It is a fact that the gloomier national or international news becomes, the more people turn to creating something with their hands. The M.A.P. magazines behind the Exhibition have markedly increased their total circulation in the last year, an indication that the enthusiastic experts who produce them are filling a real need. We hope that visitors to the Exhibition will go away full of ideas and inspiration, so that next time we shall not only have the pleasure of their company, but the opportunity of displaying their work. In the meantime, welcome to Wembley!



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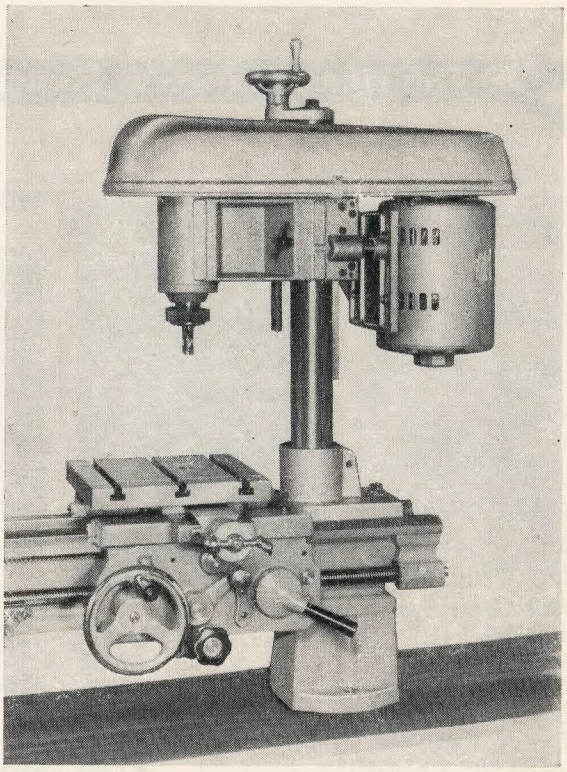

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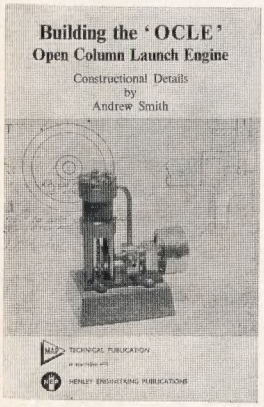

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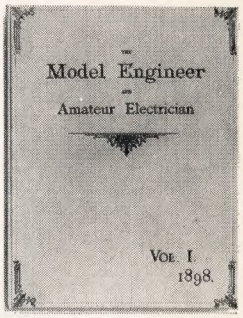

Model Engineer is a respected and popular magazine dating from 1898 when it was founded by the late Percival Marshall, the original publisher and editor. Early copies are much sought after by enthusiasts, and we have now produced a fine facsimile reproduction of the very first volume covering six months in 1898. The casebinding reproduces the style of the original and all covers and advertising pages are included. Much of the material is of practical interest to modern enthusiasts, but the entire book gives a fascinating and nostalgic reminder of the early days of model engineering.
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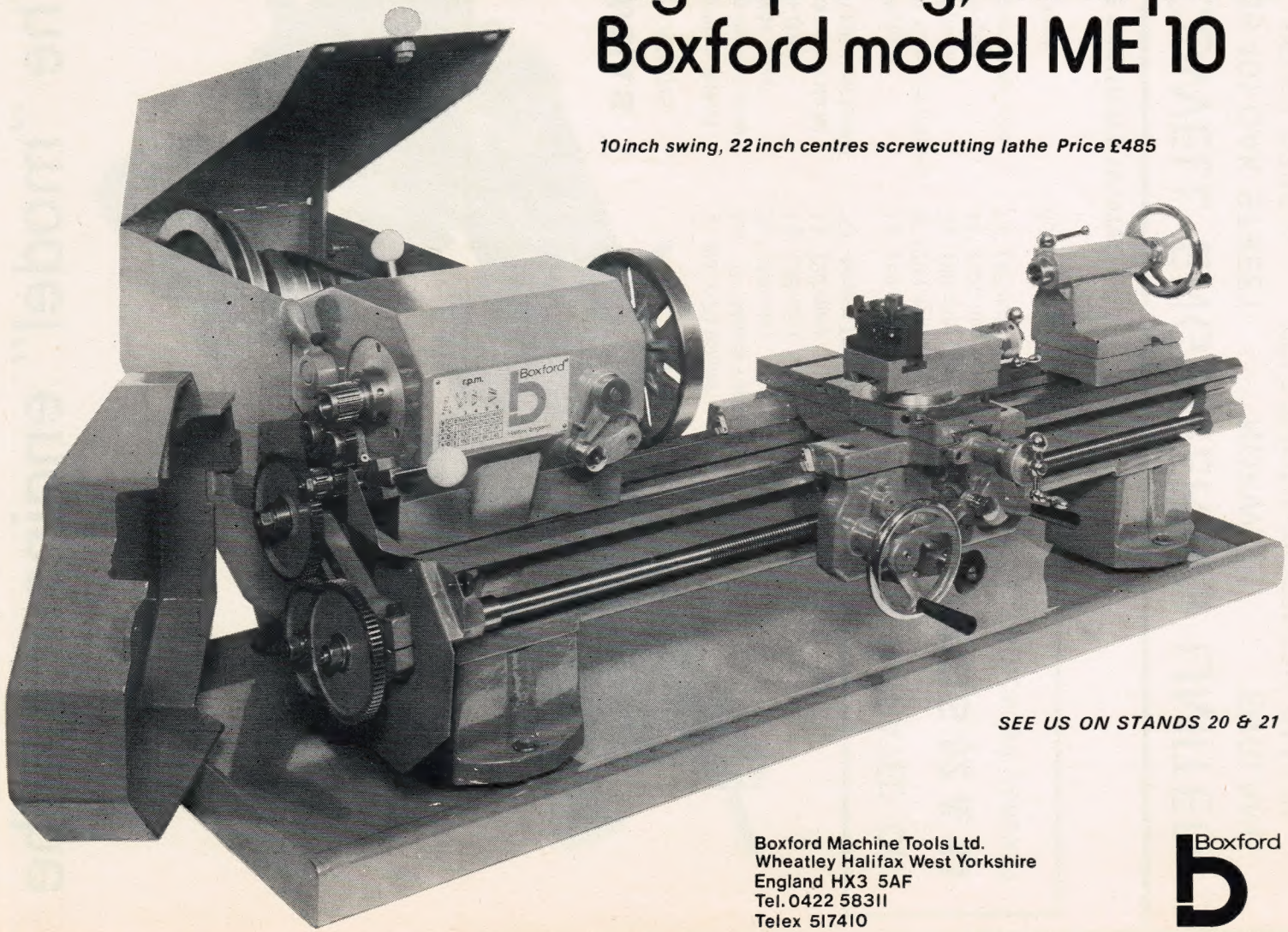

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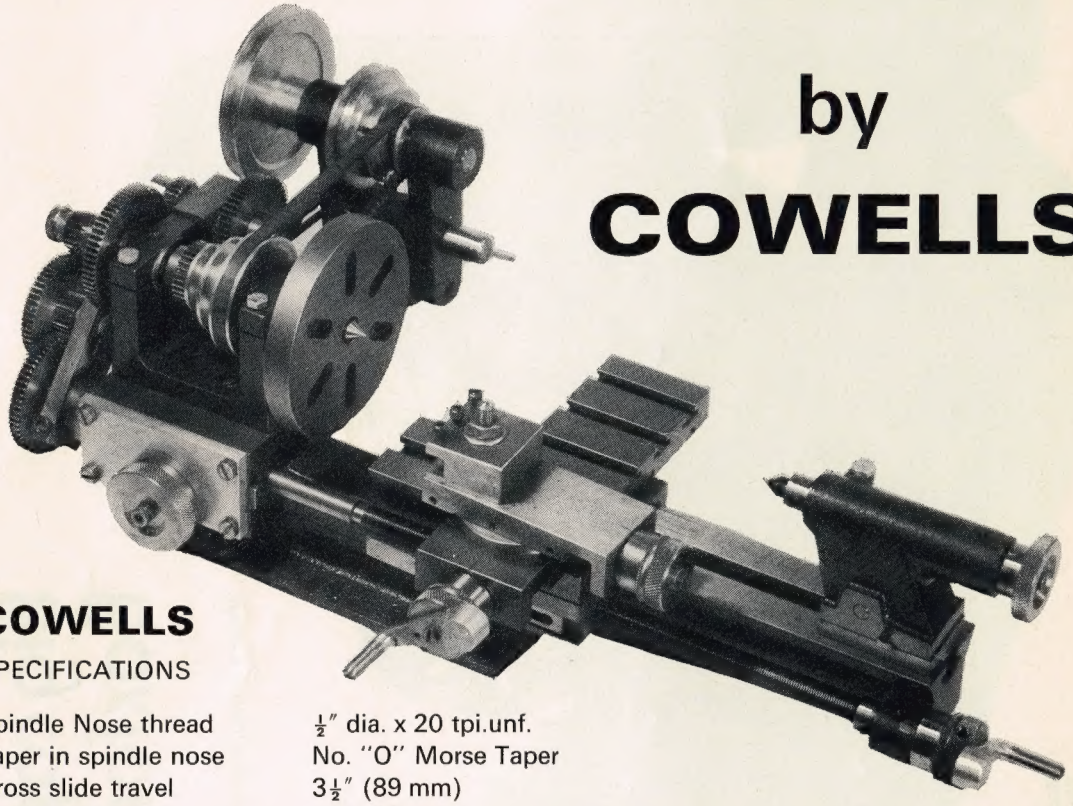

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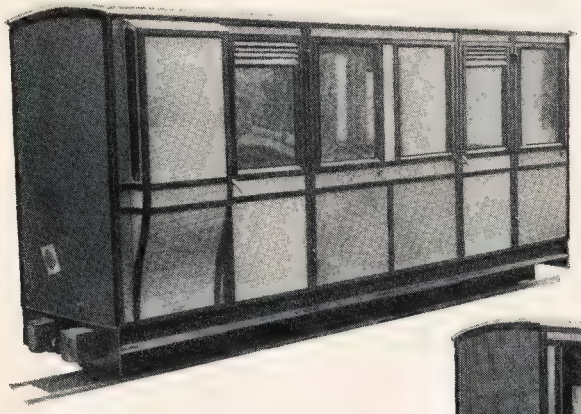

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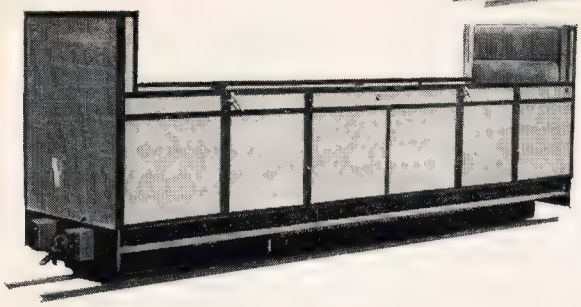

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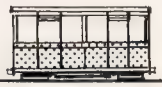

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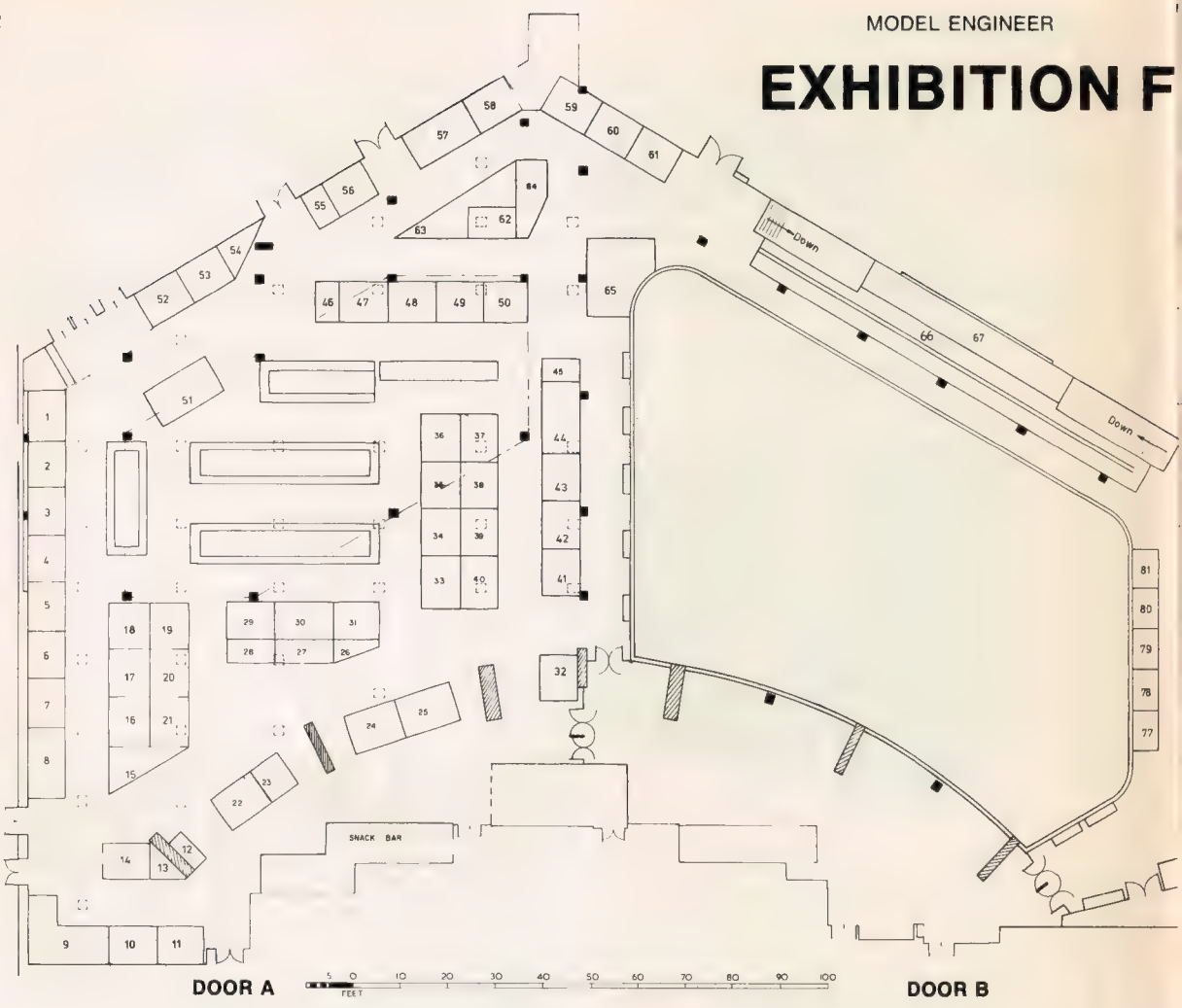

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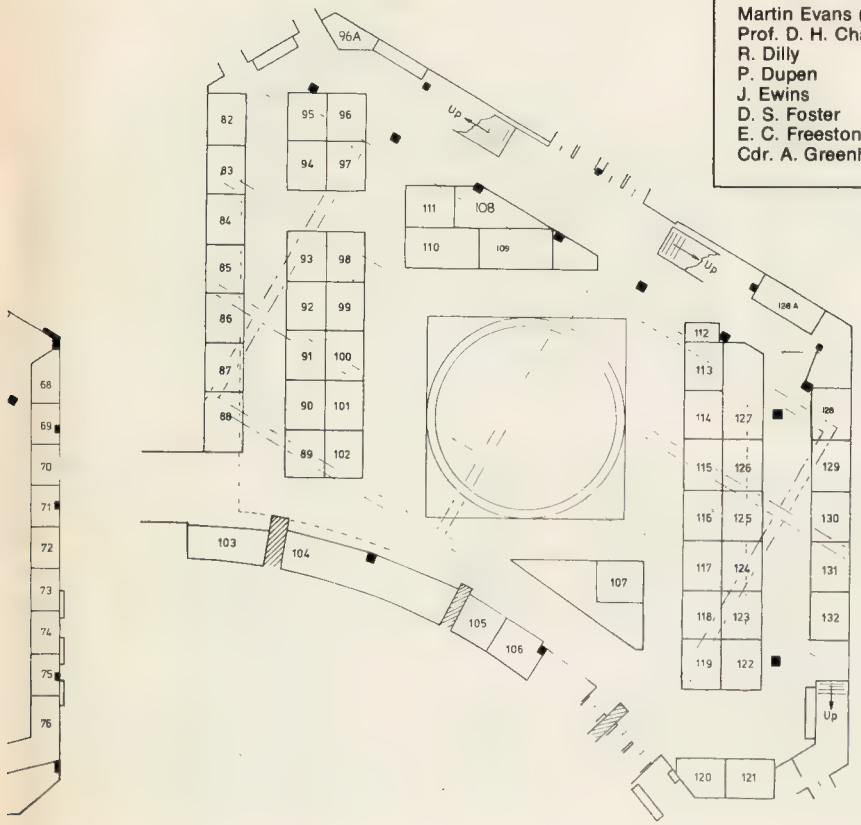

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Judges for various competition categories include:

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Woodworker Competition Entries
Additional Military Entries
Tramway & Light Railway Society working layout

AVON SUITE 3

One of 6 bars/snack bars

SEVERN SUITE 1

Demonstrations and talks on aeromodelling, model engineering etc.
11 a.m. - 7 p.m. daily
Programme on MAP stand 51

SEVERN SUITE 2

Films 11 a.m. - 7 p.m. daily
Programme on MAP stand 51
GUILD OF WOODWORKERS RENDEZVOUS POINT adjacent to Woodworker stand

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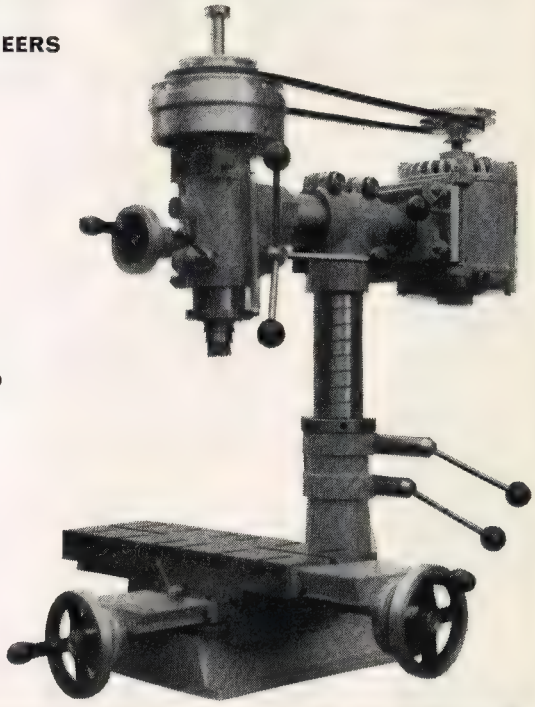

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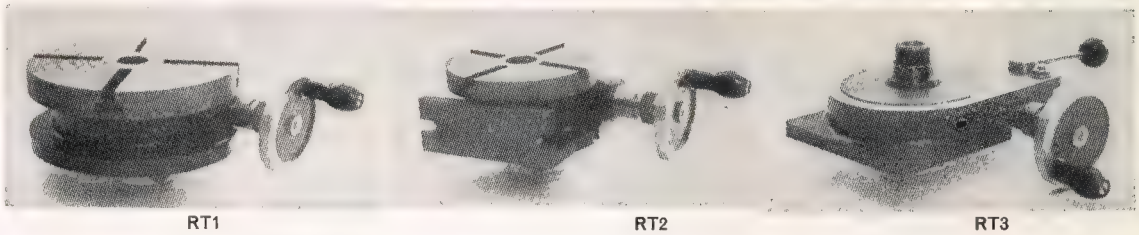

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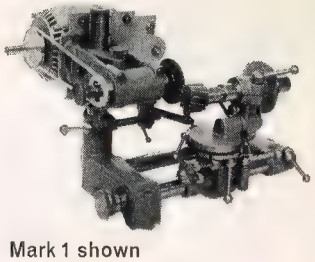

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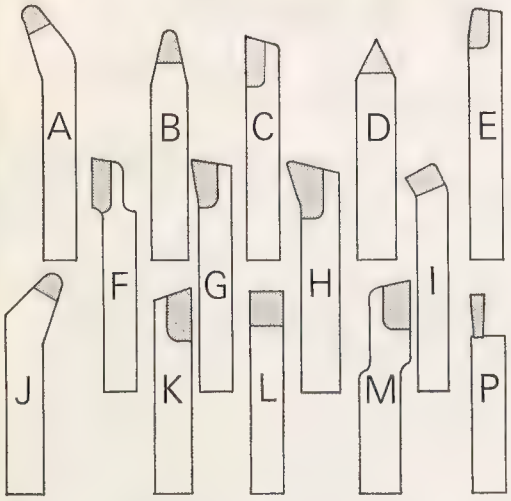

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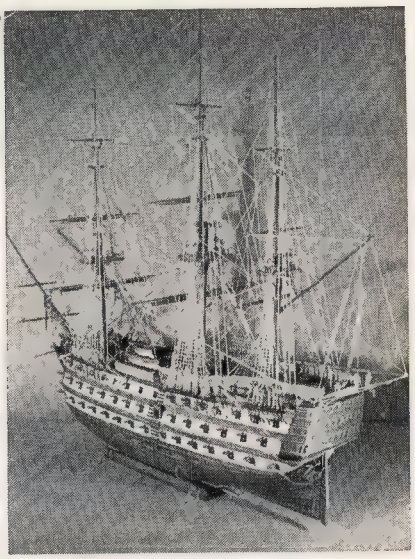

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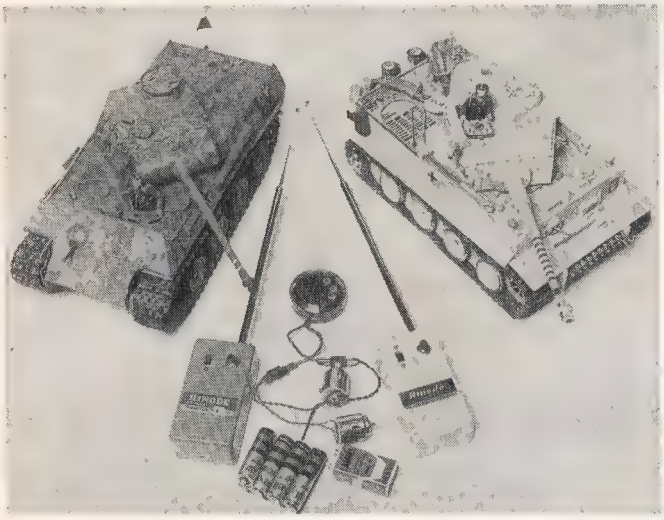

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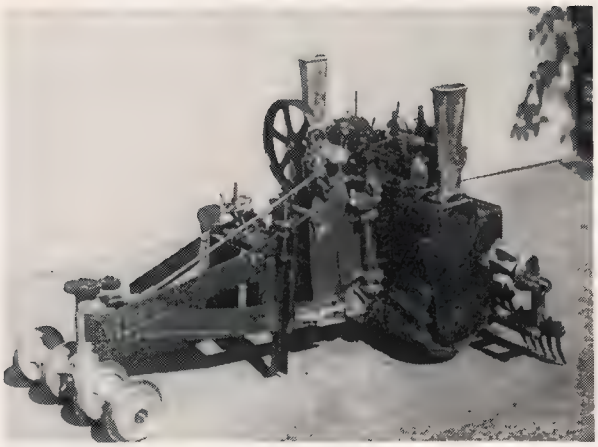
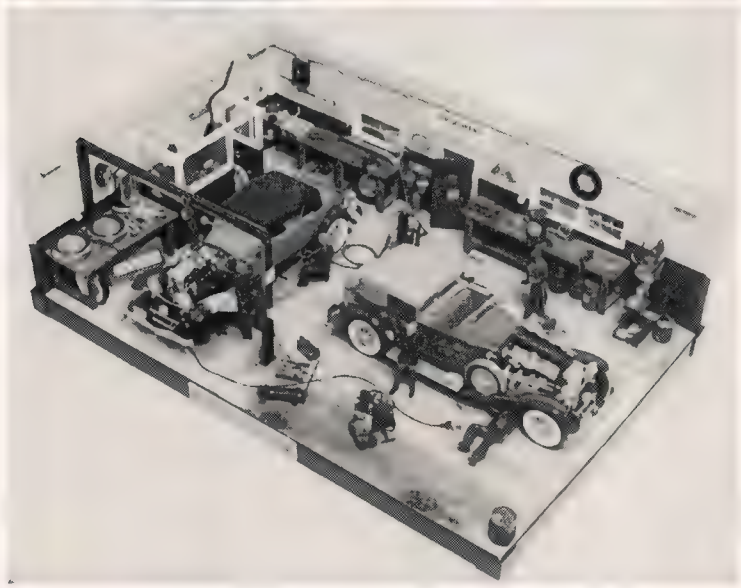




What You Will See

The increased space offered at Wembley has enabled us to accommodate many more trade stands and a whole new Woodworker section. Most of the 130-plus stands will be demonstrating a variety of products and techniques, so there will be plenty to watch and learn.

This year we have placed a flying circle for electric aircraft at floor level, which will enable the fliers to perform more of the tricky aspects of flying. There are competitions for modellers who bring their own aircraft and connection details are available c/o the Exhibition Manager. R/C vehicles will also put in an appearance from time to time in the demonstration area.

Once again the Society of Model & Experimental Engineers will have a live steam track, a demonstration workshop area, and a display of "static" models, many running on compressed air supply. There are several other stands manned by model engineering societies, as

Top left: A Savage/Darby Broadside Digging Engine in 2 in. scale by Colin Tyler. Top right: Fowler 2F Dock Tank in 5 in. gauge by G. F. Hennell and the late S. F. Hennell. Centre: Blue Funnel cargo liner M.V. *Machaon* **by G. R. Michell and, left, E. F. Bolton's 1/24 scale Duesenberg garage scene.**

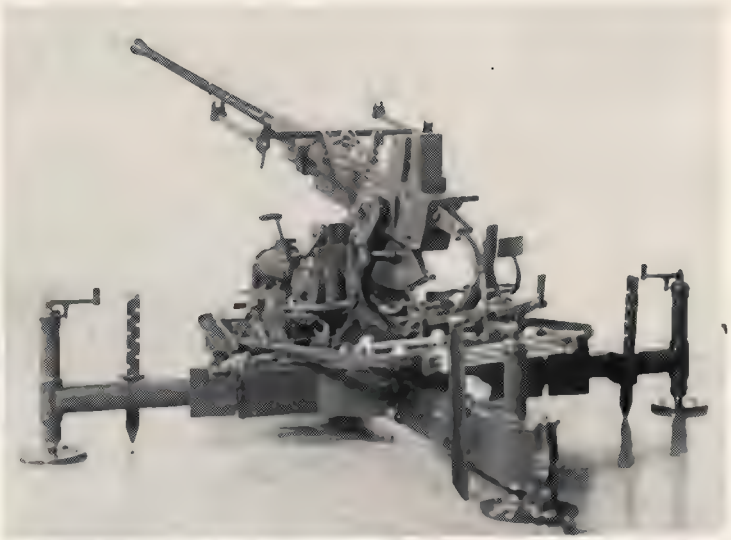
well as national bodies such as the Model Yachting Association, Society of Model Aeronautical Engineers, Model Power Boat Association, British Model Soldier Society, etc. Advice and information is freely available at all of these stands.

There is again a fine entry of models in the competition sections. After the outstanding number of large locomotives in 1976, a smaller entry this year seemed inevitable, but quality will still be high. In other categories numbers are generally increased, or, where additional classifications have been introduced, the overall totals have increased. The photographs of models shown here are, in effect, a random selection of exhibition entries and should give an idea of the variety and standard. A noticeable feature is the number of wagon and cart models, for which we must consider a special category in 1978!

New this time are categories for model boats built from kits, and junior military classes, while two special events are for Colonial class military figures and hot air engines, the latter to be run and their output measured during the exhibition. Closing date for these two events is after press date for this special issue, but an encouraging number of entries has already been received.

Four theatres are in use elsewhere in the building — one has Woodworker competition entries, some of the 180 diorama exhibits, and a working tramway, another will have films of instructional or general interest, a third continuous demonstrations of woodworking tools and methods, and the fourth lectures and demonstrations on a variety of subjects from model flying to lost wax casting. A list will be displayed on the M.A.P. stand (51) and tickets will be available in advance for individual talks.

Additionally there will be six bars open from 10.30 a.m. daily, spread throughout the building, each serving tea, coffee, soft drinks, sandwiches etc. in addition to beers and spirits, and a 400-seat restaurant on the third floor will be open for meals.



Top: A ⅛ size 40 mm. Bofors gun by John Clancey, an unusual and ambitious subject. Centre: 1 in. scale model of a Gurney Steam Carriage by W. Stokes. Right: A Royal Aircraft Factory F.E.2b by J. Larter; at 1¼ in. scale it is 7 ft. wingspan and flies on a 10 cc. engine.

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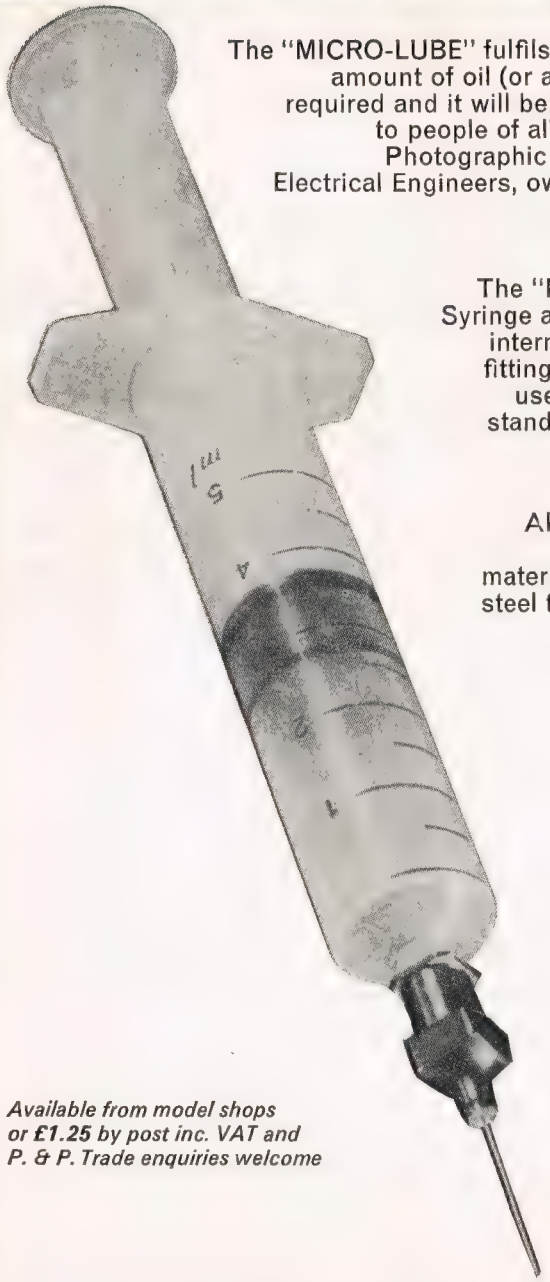

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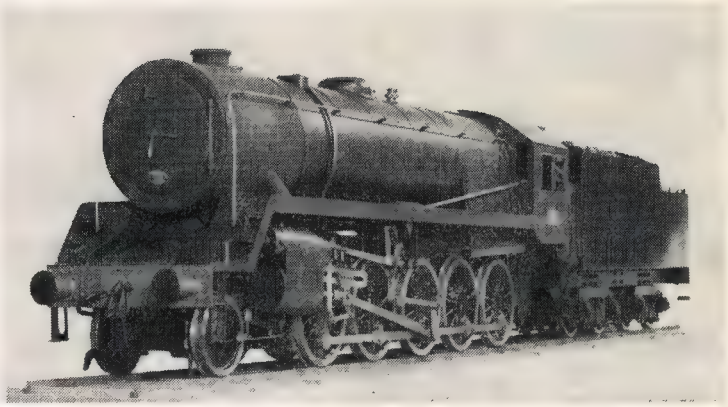
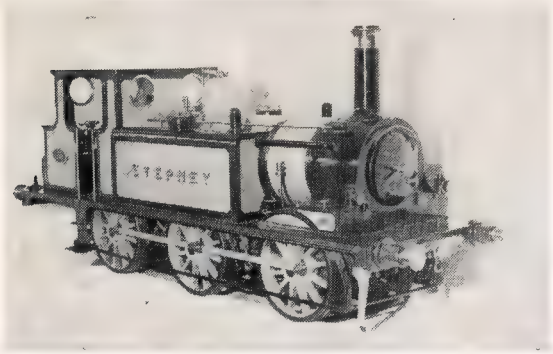
The Model Steam Locomotive in 1977

Martin Evans, Editor of Model Engineer, discusses size and suggests prototypes



WRITING in the 1974 *Model Engineer* Exhibition Handbook & Guide, I made some suggestions of how the budding builder of a live steam locomotive could build a passenger hauler for a fairly modest outlay. The rapid inflation over the past two years might have frightened our less well-off enthusiasts away from the hobby altogether. I am very glad to say, however, that in my visits to Societies and Model Engineering Exhibitions, I have seen no sign of any slackening in the building of model locomotives.

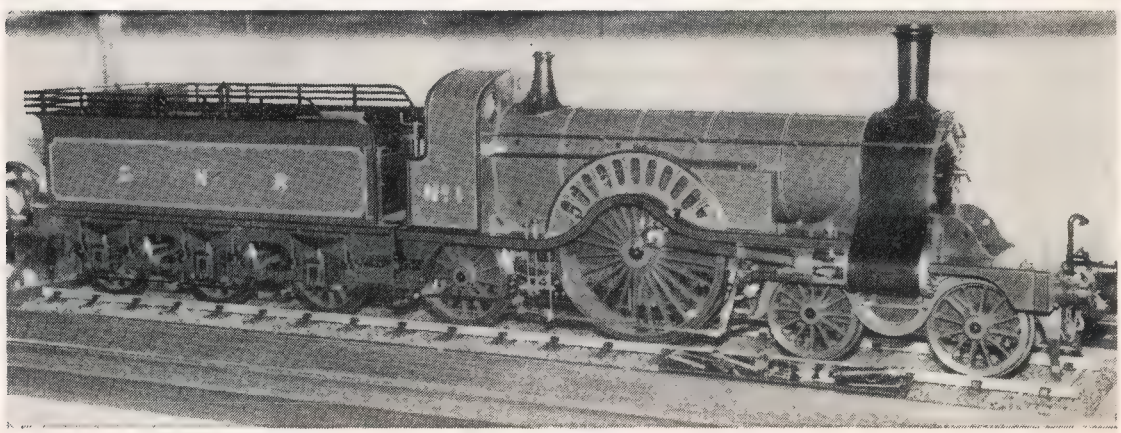
There has perhaps been some increase in interest in the smaller gauges, particularly in Gauge "1" and 2½ in., but this is all to the good, as the 3½ in. and 5 in. builders had been having things rather their own way in recent years.



I know that some readers have thought that I was somewhat biased against the smaller gauges, particularly as most of my recent designs have been for 5 in. gauge, and the two locomotives which I am building myself ("Nigel Gresley" and "Super-Claud") are both for this gauge; but my new series on a Gauge "1" L.B.S.C.R. "Atlantic" may help to dispel this idea.

The popularity of the bigger gauge locomotives is undoubtedly due to the many fine continuous tracks that the larger model engineering societies have built in recent years. It is really a form of Parkinsons' Law, that the more tracks that are built, the more locomotives come along to fill them!

When the enthusiast sets out to build his first model steam locomotive, he is immediately faced with one of his biggest problems — which type of locomotive to model. The choice seems so enormous, from the tiny narrow-gauge 0-4-0 tank to a huge "Garratt" or "Mallet" with four cylinders and a multitude of driving and coupled wheels. Of course these very big engines are not for the beginner, and even the experienced locomotive builder should think twice about starting a Garratt or Mallet, as apart from the enormous amount of work involved, making the project one for five or more years' hard work, the finished model will be difficult to drive and even more difficult to transport, from house to track. This latter point can to some extent be overcome if a wheeled transporter is made up, having rails arranged at about the same height as the floor of the estate car or van (I nearly said car, but few cars would take an engine of this type, unless to ½ in. scale or smaller).



I know that many builders set out with the fixed determination to build a L.N.E.R. "Pacific". L.M.S. "Duchess" or G.W.R. "King", and far be it from me to discourage them, but there is a lot to be said for the medium-sized express or mixed-traffic engine, such as a two-cylinder 4-6-0 or 2-6-0, and there was a great variety of locomotives with these wheel arrangements on the railways of this country.

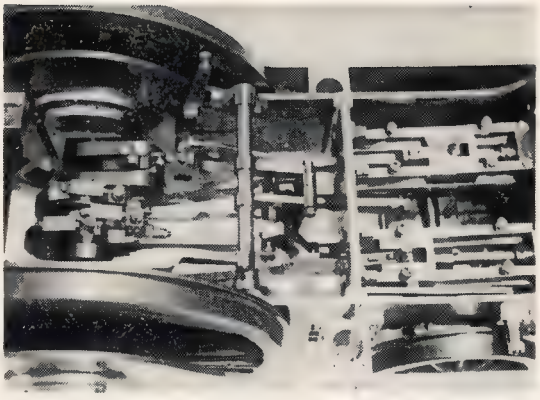
Among the British 4-6-0's, the Great Western "Halls", "Granges" and "Manors" are worth careful consideration as prototypes, especially the two latter, as these normally had the low-sided 3500-gallon tender, making them ideal from the driving point of view. Other attractive 4-6-0's which are not too difficult to build include the L.N.E.R. "B.1" and "B.2" classes, the Southern Railway "King Arthurs" and mixed traffic "S.15", and the L.M.S. "Black Fives". For those who prefer the earlier designs, what about a model of the first 4-6-0 to be built in the country — the Highland Railway "Jones Goods", with roundtop firebox boiler, outside cylinders and inside Allan straight-link valve gear?

The 2-6-0 wheel arrangement was deservedly popular, both in this country and America. The Churchward variety had a great deal in common with the "Manor" class. The L.N.E.R. and the Great Northern before it had several fine classes, from the early small-boilered K.1. to the big three-cylinder "K.3" — not the easiest to build, what with the inclined inside cylinder and conjugated valve gear. But the later Thompson "K.1." with two cylinders only should be comparatively easy to build.

The Southern had four main classes of 2-6-0, both two and three-cylinder while the Hughes/Fowler "Crab" makes a very interesting prototype, avoiding the taper barrel boiler of the later Stanier design.

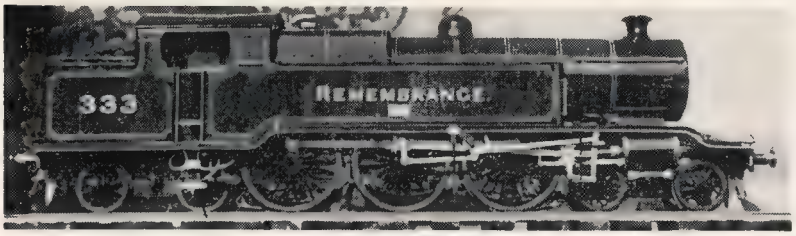
Another "Mogul" that seems to have been rather neglected as far as models are concerned is the L.B.S.C.R. design, a straightforward outside cylinder type with inside Stephenson valve gear. Its tender is of modest size and not too high in the side sheets, so would make a good driver's engine.

The inside cylinder 0-6-0 type of locomotive has always been regarded as a typical British variety, and almost every pre-group line had at least one example, in fact the "big four" continued to build them, the very last in this country being the controversial Southern "Q.1.", designed by Bulleid; controversial only as regards its rather weird and austere appearance, though in actual fact it was quite conventional in its design, very different from Bulleid's later engines!



Some builders have in the past been frightened off locomotives with inside cylinders and valve gear, mainly due to the difficulty in making the two-throw crank-axle, and also the problem of fitting in the eccentrics, especially where the valve gear is Stephensons, requiring four; perhaps that is why Joy gear, which dispenses with eccentrics altogether, is often preferred.

I hope and believe that 1977 will again be a vintage year for model locomotive building, and I think we shall see an increase in narrow gauge types, and perhaps in the medium sized 3½ in. and 5 in. gauge express passenger and mixed traffic locomotives.



Above: The motion of Mr. G. E. Thornton's 5 in. gauge "Princess of Wales".

Left: Another L.B.S.C.R. locomotive, 4-6-4T "Remembrance" in 5 in. gauge by Mr. A. C. Perryman.

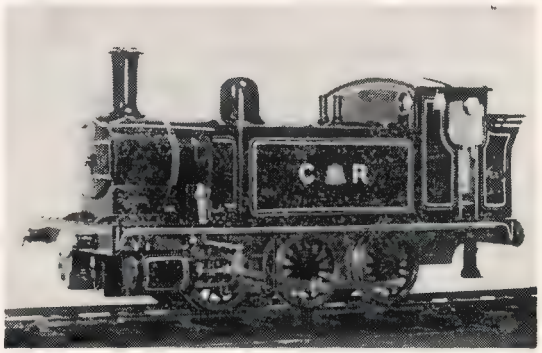
Below: Laurie Joyce's 3½ in. gauge G.W.R. "King".

Bottom: A popular 3½ in. gauge subject, the 0-6-0T "Rob Roy".

Opposite page, top: An unusual 3½ in. gauge 2-10-0 by Mr. B. H. Fogg.

Centre: The L.B.S.C.R. "Terrier" is a popular small tank locomotive.

Bottom: A fine 3½ in gauge Stirling "Single" by Albert Peacock.



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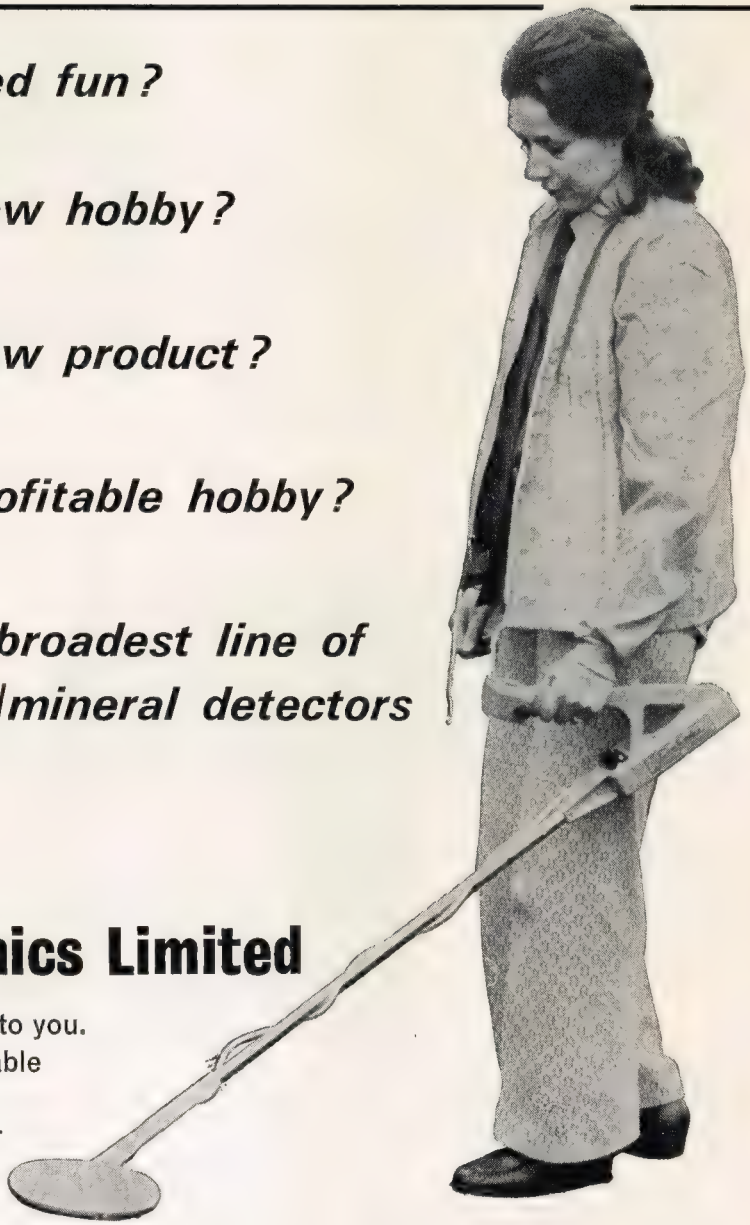

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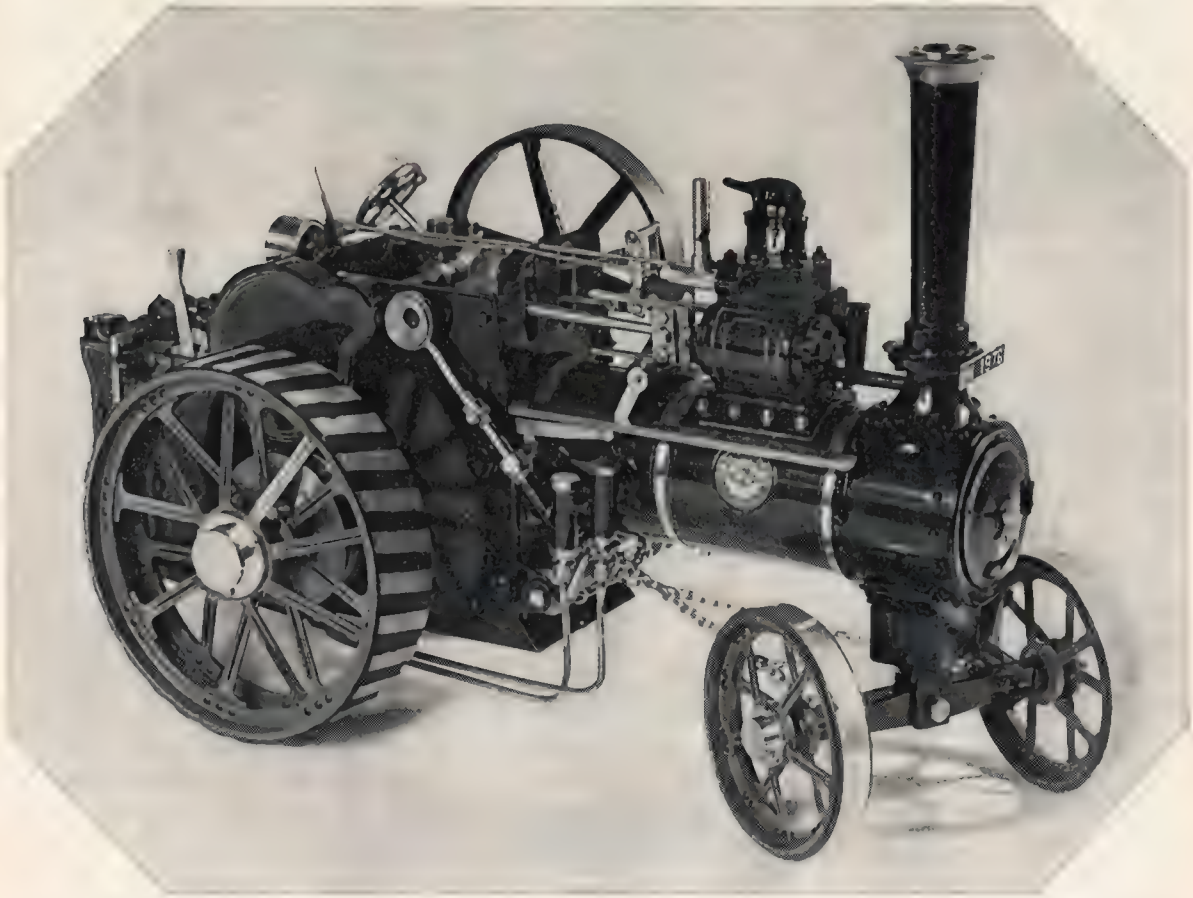

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The Craftsmen Woodworkers

by Anthony Talbot, Editor of 'Woodworker'

THE Woodworker Show, first of its kind, heralds a new chapter for the craftsman woodworker. Here is a show aimed not at the casual handyman, but at the hundreds of craftsmen all over the country who spend their working lives making beautiful things from wood. Cabinetmakers, woodturners, woodcarvers, polishers, musical instrument makers — all, for the first time, able to demonstrate at a National Show their skill and artistry.

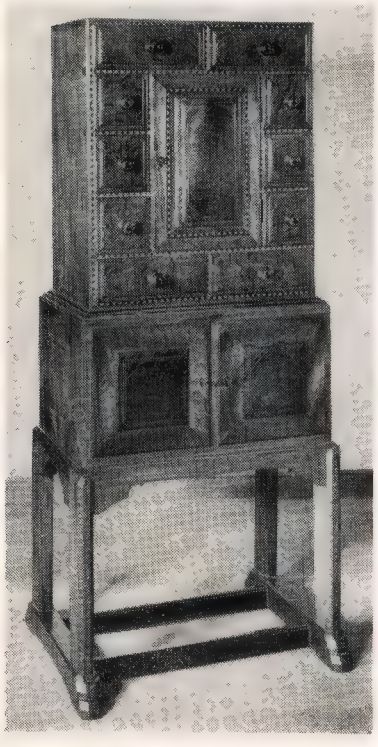
For a while they have taken a back seat, overshadowed perhaps by the commercialised bandwagon that the "do-it-yourself" movement generated, but they emerge again to show us that the old, classic skills are alive and thriving. They work away quietly, individualists in their workshops, asking little except an appreciation of their efforts. They rub shoulders with the great craftsmen of the past and draw their inspiration and their dedication to fine work from those that went before.

Visitors to the Show may be surprised to find that this high quality woodwork is not necessarily an old man's game — kept alive by a few old die-hards. There are young men turning out exquisite work and here, in the competitive exhibition sections, they compete on equal terms with the old hands. There is no demarcation between the amateur and professional; all are paid the high compliment that each is working to the same high standard and no lip-service is paid to mediocrity.

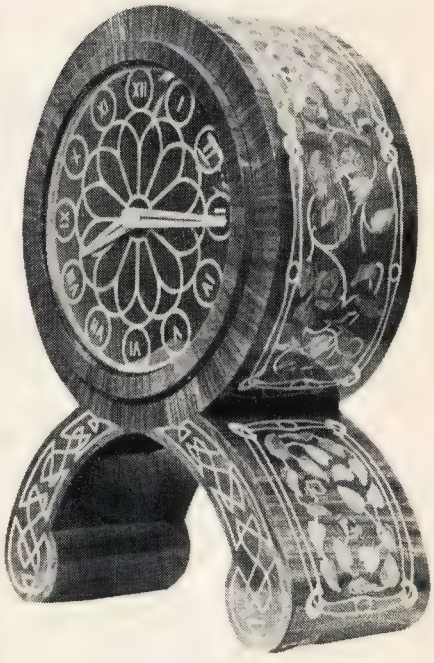
Woodworking and allied activities are legion and this is one of the great fascinations of the craft. Cabinetmaking, which is the production of high quality furniture pieces from chairs and tables to tea caddies and jewel boxes, woodturning, woodcarving, marquetry, pyrography, staining and polishing, upholstery, picture frame making, gilding, veneering, joinery, shopfitting, show-case making, toy making, caning and rushing, geometric drawing and designing, the study and collection of old tools, toolmaking, boatbuilding plus many, many more including all the specialised trades such as the wheelwright and the cooper.

Those who have only a passing knowledge of woodwork may be a little puzzled that no mention has been made of the carpenter. In the main this is because his work tends to relate to the building trade. The joiner makes the doors and the windows and the carpenter fits them. He is, these days, more a fitter than a maker of things and in this respect he is the man responsible for the main wood structures in building, including the roofing structure, which can be an art in itself nevertheless. He is rarely called upon to produce finely finished work because much of what he does is, in fact, never seen. He is thus not required to cut the fine dovetail joints that excite admiration of the cabinet-maker — his is the world of the rough sawn four, six and eight by two planks and the six inch nail. However, on the occasion he is given his head on some specialised piece of roofing or interior exposed timbering he can turn out some startlingly beautiful work.

In days gone by, when each village had its own rural carpenter, he would have been required to turn his hand to all sorts of work. Some of the village carpenter's furniture, for instance, is now much sought after. Rougher than the fine work of the cabinetmaker, it nevertheless had a simple charm and homespun character which is endearing.



A beautiful walnut cabinet on stand, made about 65 years ago. Such work is still being produced.



And serving all the woodworking tradesmen, down through the years, are their suppliers — the toolmakers, the timber merchants and dealers, the makers of finishing materials, glues and adhesives, the screw and nail makers, the makers of knobs, hinges, handles; and they are here today at the Woodworker Show. All, perhaps, a little more sophisticated in the methods they employ to sell their wares but basically, still, supporting and supplying a noble craft.

On many of the manufacturers' stands the visitor will find some quite advanced machinery. These are not, however, the tools of the mass produced furniture maker but they are the mechanical aids that lend the craftsman woodworker time to employ his skills to greatest advantage — the handwork and fitting of joints, the finishing, the care — yet still allow, in these pressing times, an eye for the economics of his trade. And here are the tools he loves and which become an extension of himself — the chisels, the planes, the saws, and carving tools — each designed to serve a particular purpose. Each designed to assist the craftsman in his never ending search for perfection.

We hope visitors to the Show will take a little time to ponder these things as they examine the exhibits in all their classes and wander round the various trade stands. To bear in mind that each and every exhibit was made by a man who put his heart and soul to the task and whose purpose, first and foremost, was to create a thing of beauty and whose satisfaction and reward was in its making — and his profit the achievement of what he set out to do. Talk to these men who are never rich yet endow our lives with richness.

Woodworking is a craft of friendship and if a spark has been kindled by your visit to the Show, do not be inhibited from allowing tentative thoughts of "I wouldn't mind having a go at that" being crystallised into practical resolve. For you will see nothing today that is not within the grasp of your own two hands.

Opposite: Not everyone's taste, but this marquetry clock is exquisitely made.

Right: Another early 20th century piece, a walnut chest.

Below: Modern pieces in classic style by Norfolk Furniture Makers.

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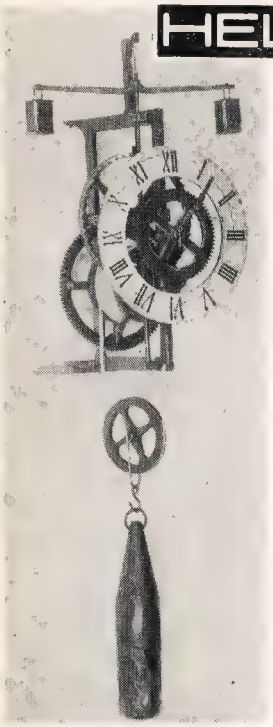

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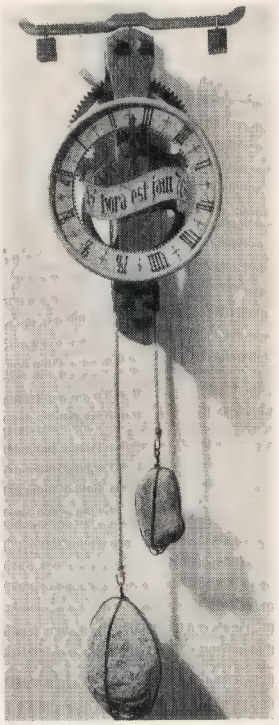

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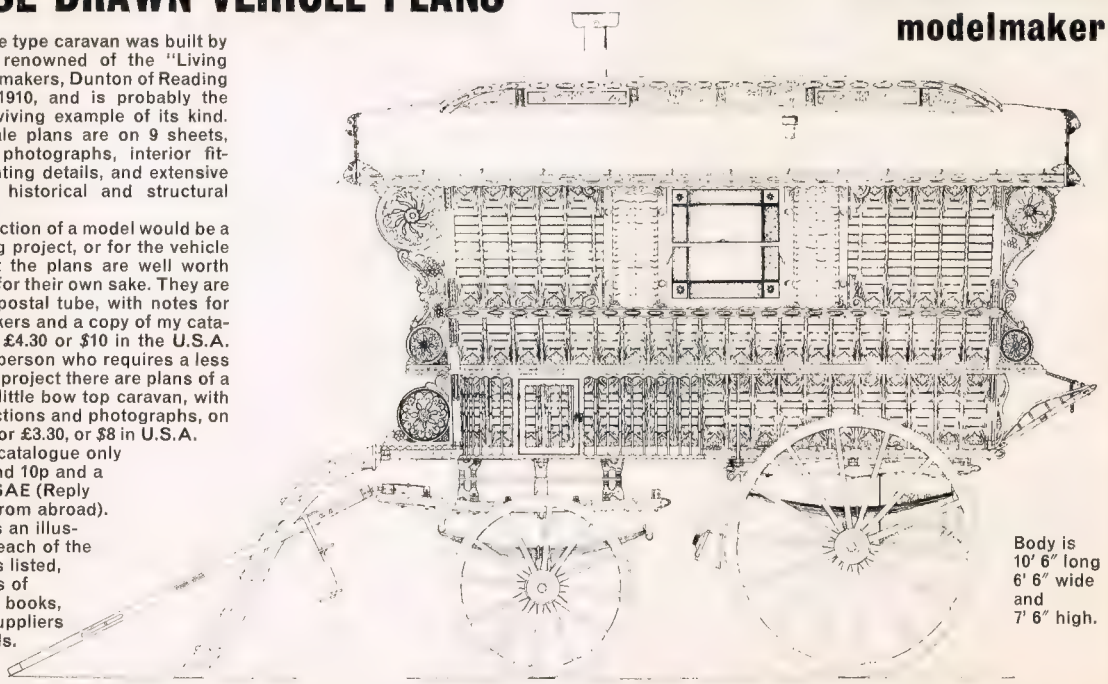
Construction of a model would be a fascinating project, or for the vehicle enthusiast the plans are well worth obtaining for their own sake. They are sent in a postal tube, with notes for model makers and a copy of my catalogue, for £4.30 or $10 in the U.S.A.

For the person who requires a less ambitious project there are plans of a delightful little bow top caravan, with full instructions and photographs, on 8 sheets, for £3.30, or $8 in U.S.A.

For the catalogue only please send 10p and a foolscap SAE (Reply coupons from abroad). It contains an illustration of each of the 30 vehicles listed, and details of museums, books, kits and suppliers of materials.



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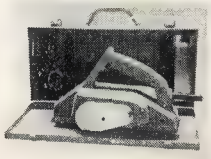

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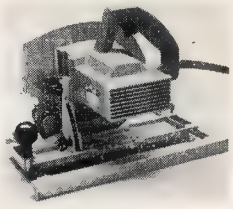
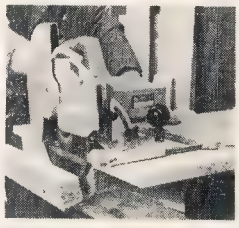
Planer set comprises carrying case, bevel fence, protection guard, adjustable side fence, spare set of HSS cutter blades and dust bag.

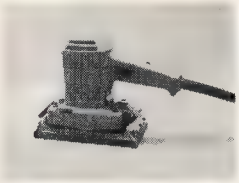
Panel Saws MH 55 & MH 82





Panel Saws . . . Models MH 55 and MH 82
The only rip saws designed especially for cutting panels.
* Side fences have reversible guides to simplify cutting to a straight edge
* Two models with 2 3/16" and 3⅛" cutting capacity.
These powerful double insulated saws with approximately 1½ and 1⅞ h.p. motors are years ahead in design and performance.

Orbit Sander MVS 93

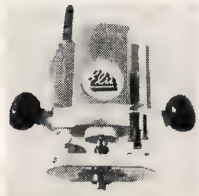


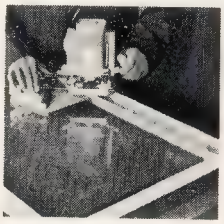
Orbit Sander . . . Model MVS 93
This sander has a high degree of cutting power.
* High speed . . . 20,000 strokes per minute
* Large orbit stroke . . . 3.5mm across.
The balance of this sander is superb. It does not leave your hand shaking after use!

Belt Sander MHB 90

High Speed Belt Sander . . . Model MHB 90
This 4" sander sucks up 95% of the dust when sanding.
* Really robust and ideal for preparing painted surfaces.
* Inversion stand converts hand sander into a finishing machine
It takes only a matter of seconds to change or re-align the belts.

Router Set MOF 96





Hand Router Set . . . Model MOF 96
This router with the "plunging" action is so simple to set up and use. Numerous operations can be performed.
* With the ELU, the cutter enters and leaves the work at 90°.
* A routing manual with 100 illustrations is offered free with each machine.
This router is supplied complete with adjustable fence, depth stop, guide bush and two HSS cutters.

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Military Modelling — art, engineering, or just fascinating modelling

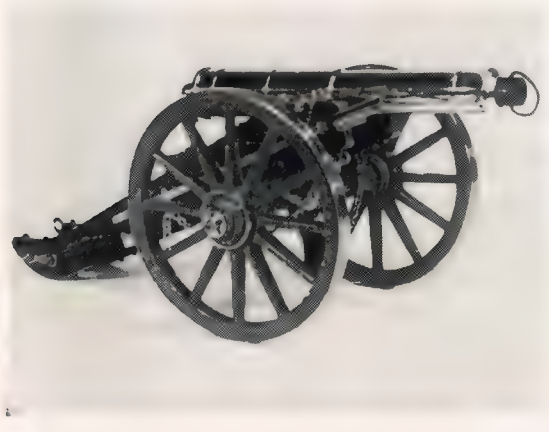
says Alec Gee, Editor of 'Military Modelling' and 'Battle'

Top: A painting or a diorama? Actually, it's a model but it's difficult to tell with this superb 54 mm. multi-figure diorama showing the defence of the redoubt at the battle of Bunker Hill, 1776. The impressive set-piece was one of a series of 17 at the Boston Museum of Fine Arts to commemorate America's bi-centenary last year.

Right: A 4th regiment French Napoleonic Cuirassier delicately plucks a lady's hankie from a bush with his sabre; an artistic idea beautifully executed in 54 mm. from Historex parts by Graham Brown.

Bottom Right: £300 worth of porcelain sculpture by Michael Sutty who has a London gallery: it depicts a mounted 16th Lancer of 1898.

Below: You don't have to build your own! Commercial military model engineering reflected in this 1/10 scale 12 pdr., twin trail cannon of 1790-1825; it comprises turned brass, steel and copper parts and, although more "representational" than precisely accurate, is an attractive replica, nevertheless.



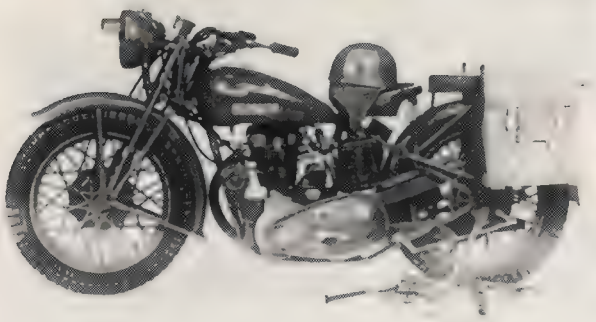
Above: Simple posing of converted 54 mm. foot figures to create an interesting and certainly different vignette by modeller Graham Brown using Historex kits for French Napoleonic artillerymen.

Top Left: Model engineers with military inclinations could do no better than try their hands at a 1:1 scale replica firearm like this beautiful Colt Navy Revolver of 1851 complete with powder flask and bullets, a competition entry at a previous Model Engineer Exhibition.

Centre Left: Creating realistic settings is half the joy of diorama building; this convincing German "Wirbelwind" by Belgian modeller Francois Verlinden is a good example.

Left: Often "knocked" by model engineers, the modern plastic kit provides a compelling finished model and an enormous amount of pleasure; this 1/9 scale W.W.2 despatch rider's Triumph motorcycle is surely such a kit.

Below: How's this for model realism? A pair of staggeringly life-like views of Tucktonia — The Best of Britain in Miniature, an enormous 1/24 scale model landscape in Christchurch, Dorset, taken by John Wylie. Left: The Mall towards Admiralty Arch and right, an 8 ft. high Windsor Castle main tower.



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SdKfz 231
SdKfz 234/1
SdKfz 234/2 Puma
Protze tractor
SdKfz 11 tractor
SdKfz 7 tractor
3.7cm Flak on SdKfz 7
Pak 35/36
Pak 38
Pak 40
Pak 43/41
Pak 43 8.8 on cruc. trail
7 62 Pak 36 (r)
10.5cm howitzer
15cm howitzer
17cm howitzer
8.8 Flak
7.5cm G36 mountain gun
7.5cm infantry gun
15cm infantry gun
Nebelwerfer
Karl tracked mortar (15p)

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T34/76D
T34/85
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KV2
SU85
SU100
T35
T28
JS II
JS III
ISU152
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BA-10
BA-32
T-70
BA-64
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GAZ-60
JAG-12
GAZ-67 (6p)
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Katyusha on GAZ
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M41 57mm AT
M44 100mm AT
M39 76.2mm
M37 122mm howitzer
152mm howitzer
203mm tracked howitzer
SU76
SU37-1
Komsomlets
Stalinets
BT-7

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Grant
Sherman M4A1
Firefly
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USA

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M5 Stuart
M24 Chaffee
M18 Hellcat
M4A3 Sherman
M4A3E2
M4A3E8
M4A1 dozer
M10
M36
M26 Pershing
M7B1 Priest
M12 155mm
M3 ½-track
T19 105mm
M3 75mm GMC
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LVT Buffalo
Greyhound M8
Studebaker 2½ ton
3in AT gun
75mm Pack howitzer
105mm howitzer
155mm Long Tom
M16 SPAA
Weasel
M4 H.S. tractor
Dodge Weapons Carrier

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Crusader AA Mk I
Crusader AA Mk2
Scammell Tank Transporter
Chevrolet Petrol Tanker
Bedford GL with office body
Sherman Calliope
Studebaker gasoline truck
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M163 Vulcan
M114
M109
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XR311
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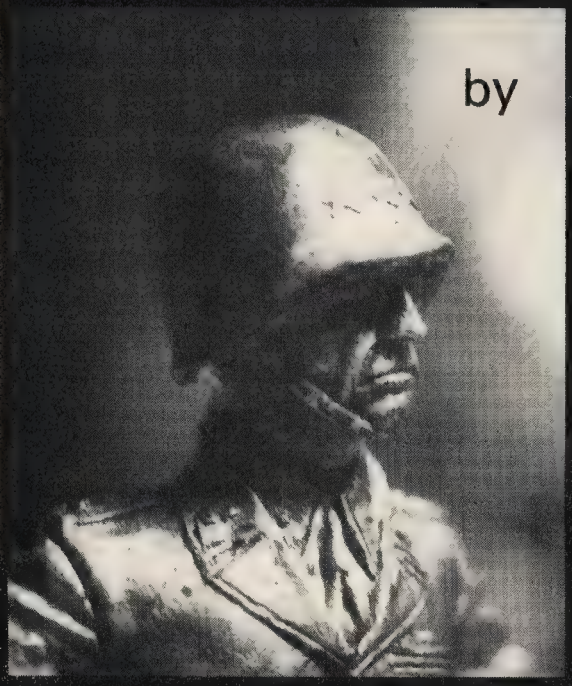

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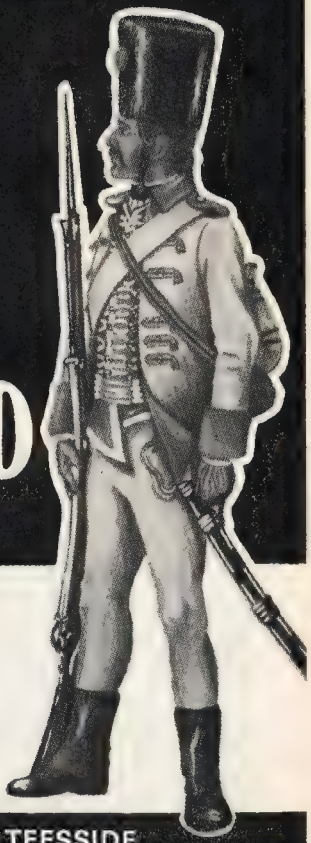

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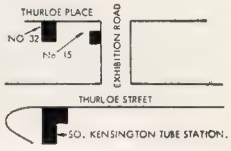

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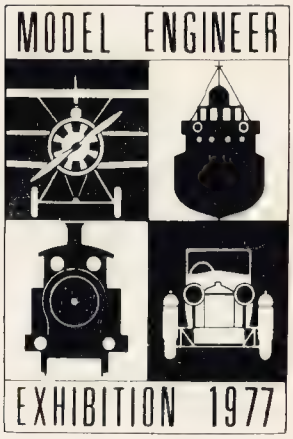

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4	H.M.S. *Hornet,* 1828, 3/16 in. scale	F. Hinchliffe *(Huddersfield)*

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3	B.R. Class 9 92000, 3½ in. gauge	R. W. Gale *(Newport, Gwent)*
4	Princess of Wales 4-4-2, 5 in. gauge	H. G. Winton *(Coulsdon)*
5	Juliet 0-4-0T, 3½ in. gauge	N. V. Terry *(Alvechurch)*
6	Britannia, 5 in. gauge	G. Munday *(Oakham)*
7	L.B. & S.C.R. Terrier 0-6-0T, 5 in. gauge	D. S. Paterson *(Maidstone)*
8	Mills class Hunslet No. 554, 3½ in. gauge	J. Keeling *(Upminster)*
9	Fowler 2F Dock Tank No. 11269 0-6-0T, 5 in. gauge	G. F. Hennell and the late S. F. Hennell *(Iver Heath)*

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2	Pansy 0-6-0 tank, 5 in. gauge	W. R. Skuse *(Ramsgate)*
3	Minx, 0-6-0, 5 in. gauge	F. J. Willson *(Warrington)*

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No.	Description	Name and Town
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2	Narrow gauge 0-8-0 tender locomotive, gauge 1	W. E. Lever *(Birmingham)*
3	2-6-0 + 0-6-2 L.M.S. Garratt, gauge 0	M. H. Wheat and the late H. C. Wheat *(Hendon)*
4	Double Fairlie locomotive Taliesin, ¾ in.	C. Spencer *(Bolton)*
5	L.N.E.R. B12 class 4-6-0, gauge 0	J. S. Bremner *(Southwick)*
6	4-6-2 Express Tank in Meccano, gauge 0	H. J. Halliday *(London)*

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The cups and medals will be forwarded to the successful competitors as early as possible after the close of the Exhibition, when names have been engraved and diplomas signed.

PRIZE POOL ALLOCATION

Classes attracting six or more entries will enjoy prizes to the value of 1st £5; 2nd £3; 3rd £1. With over 12 entries 1st £7; 2nd £4; 3rd £2; 4th £1. Classes under six will have 1st and 2nd only; or at the discretion of the judges may be amalgamated with other classes, or given a discretionary award only. Prizes may take the form of Vouchers, Cash, Replica Trophies (for Challenge Trophy winners) or Championship Trophies.

NATIONAL AWARDS

A number of magnificent trophies have been donated in the past for competition in *Model Engineer* Exhibitions. These cups and trophies are awarded on the occasion of *M.E.* Exhibitions. Winners hold their trophy for one year only.

JUDGING

Judging will take place immediately before the Exhibition opens. Printed results should be available by the day following and will be available on demand by visitors.

*SILVER AND BRONZE MEDALS

Offered in all classes, provided the work is considered by the judges to be of medal standard. The medals will be awarded on the quality of individual models, and not on any placing of the entries in order of merit in a class.

*Silver and bronze coloured.

DIPLOMAS

The judges are empowered to award diplomas in recognition of special merit in all classes of at their discretion.

CERTIFICATES

Certificates of entry are given to the owner of every model exhibited in the Competition sections.

DUKE OF EDINBURGH CHALLENGE TROPHY

1 A very handsome silver tankard, this trophy shall be known as The Duke of Edinburgh Challenge Trophy, and shall be awarded to the winner of the Championship Award at The Model Engineer Exhibition.

2 The trophy shall remain at all times the property of Model & Allied Publications Ltd.

3 The name of the winner and the date of the year in which the award is made shall be engraved on the Trophy, which may remain, at the discretion of Model & Allied Publications Ltd., in his possession until required for renovation and display at the following Model Engineer Exhibition.

The winner shall be presented with a suitably inscribed tankard for his permanent retention.

4 Any piece of model engineering work shall be eligible for the Championship Award after it has been awarded, at The Model Engineer Exhibition, a Championship Cup, Silver Medal or one of the Cups donated by Friends of the Exhibition.

5 No model may be entered more than once.

6 Entry, which shall be free, shall be made on the official Competition Entry Form. Competitors must state on the Entry Form:

(a) that exhibits are their own bona fide work;
(b) any parts or kits which were purchased or were not the outcome of their own work;
(c) that the model has not been structurally altered since winning the qualifying award,
(d) the origin of design.

7 Model & Allied Publications Ltd. may, at their sole discretion, vary the Conditions of Entry without notice.

THE AVELING-BARFORD TROPHY

Presented by the directors of Aveling-Barford Ltd., for annual award to the best working model traction engine, road roller or steam wagon.

THE BOWYER-LOWE CHALLENGE CUP

Donated by Mr. A. E. Bowyer-Lowe, to be awarded for the best example of craftsmanship and design in the Tools and Workshop Appliances class.

THE BRADBURY-WINTER MEMORIAL CHALLENGE CUP

Donated by Mrs. Bradbury-Winter and a number of friends, to be awarded annually, at the discretion of the judges, for the most outstanding example of amateur mechanical craftsmanship.

THE "BRISTOL" CHALLENGE CUP

Donated by the Bristol Aircraft Company. To be awarded annually for the best model of a "Bristol" aircraft.

THE CREBBIN MEMORIAL CUP

Donated by certain friends of the late Mr. J. C. Crebbin. To be awarded for the best entry in the Locomotive, General Engineering and Mechanically-propelled Road Vehicles Classes

THE H. V. EVANS TROPHY

Donated by the Thames Shiplovers' Society in honour of its founder, Mr. H. V. Evans. To be awarded annually at the discretion of the judges for research and/or presentation of a ship model.

THE EXIDE AND DRYDEX CHALLENGE CUP

Donated by the Directors of Chloride Batteries Ltd., for annual award. To be awarded at the discretion of the judges to the best model incorporating a battery entered in any section.

CLASS BA: Locomotives in gauges smaller than 0

No.	*Description*	*Name and Town*
1	G.W.R. Bulldog Class No. 3377 *Penzance,* 00 gauge	J. R. Prentice *(Romford)*
2	B.R. Class 9 2-10-0 No. 92027 *Franco-Crosti,* 00 gauge	K. Eden *(Bridgend)*
3	L.N.E.R. Class J39 0-6-0, 2 mm. scale	G. Balfour *(East Grinstead)*
4	Royal Scot Class No. 6113 *Cameronian,* 4 mm.	A. M. S. Darnbrough *(Leeds)*
5	L.M.S. Mixed Traffic 2-6-0 No. 2847, 4 mm.	A. E. Mould *(Dudley)*
6	S.R. (Ex L.S.W.) 0395 class 0-6-0 No. 0155, 4 mm.	C. T. Standfast *(Ilford)*

CLASS C: Rolling Stock and Accessories, gauge 1 and 0 or larger

No.	*Description*	*Name and Town*
1	Set of G.E.R. wide 4-wheel suburban coaches, 7 mm.	G. Pember *(Frinton-on-Sea)*
2	36-ton Breakdown Crane, 10 mm.	W. G. S. Bishop *(Eastleigh)*
3	L.B.S.C. Breakdown Train, 1900, loco-crane and van, 10 mm.	W. G. S. Bishop *(Eastleigh)*

CLASS CA: Rolling Stock and Accessories, gauges smaller than 0

No.	*Description*	*Name and Town*
1	G.W.R. 10T Fish Van, Dia. S2, built 1902, 4 mm.	J. R. Snowdon *(Esher)*
2	G.W.R. Dia. S1 Open Fish Truck, 4 mm.	J. R. Snowdon *(Esher)*
3	30T Bogie Mineral Wagon, to 1907 RCH specification, 4 mm.	J. R. Snowdon *(Esher)*
4	G.W.R. 25T Bogie Brake Van, 4 mm.	J. R. Snowdon *(Esher)*
5	G.W.R. Open Wagon for linoleum traffic, Dia. 0.67, 1890, 4 mm.	J. R. Snowdon *(Esher)*
6	G.W.R. 25T Bogie Goods Wagon, Dia. 0.1, 1889, 4 mm.	J. R. Snowdon *(Esher)*
7	Hull & Barnsley Rwy Refrigerated Van, 4 mm.	J. R. Snowdon *(Esher)*
8	G.W.R. Third Brake Coach, 00 gauge	C. French *(Teignmouth)*

CLASS D: Steam and Motor Ships of any period (non-working)

No.	*Description*	*Name and Town*
1	Cruiser H.M.S. *Sheffield,* 1/16 in.	L. Kirby *(Cleckheaton)*
2	Battle-cruiser H.M.S. *Lion,* 1/16 in.	L. Kirby *(Cleckheaton)*
3	H.M.S. *Bronington,* 1976, 1/16 in.	E. R. Dyke *(Wivenhoe)*
4	H.M.S. *Broadsword,* Weapon Class Destroyer, 1949, 1/16 in.	E. R. Dyke *(Wivenhoe)*
5	Cargo liner, 1/300	G. R. Michell *(Ramsgate)*
6	H.M.S. *Warspite* (late 1942), 1/16 in.	D. Andrews *(Rosyth)*
7	Passenger-cargo ship S.S. *New Fawn,* 2 mm.	A. Garvey *(Roehampton)*
8	Trawler *Progress*	J. Moffatt *(Langham)*

CLASS E: Power-driven Boat Models complete with power plant

No.	*Description*	*Name and Town*
1	Flower Class Corvette	G. C. Sumpter *(Cheltenham)*
2	RNLI Barnett Class Life-boat, ¾ in.	D. Reed *(London)*
3	K.M. *Bismarck,* German, 1/16 in.	C. M. Vass *(Flitwick)*
4	H.M.S. *Ark Royal,* 1/16 in.	C. M. Vass *(Flitwick)*
5	H.M.S. *Prince of Wales,* 1/16 in.	C. M. Vass *(Flitwick)*
6	H.M.S. *Hood,* 1/16 in.	C. M. Vass *(Flitwick)*
7	Ex. R.N. Salvage Tug *Albatross,* ⅜ in.	R. C. Jackson *(London)*

8	Fairey Marine Huntsman, 1 in.	C. Spencer	*(Bolton)*
9	Roll on/Roll off Container Ship, ⅛ in.	C. Spencer	*(Bolton)*
10	Motor launch *Sea Spray*	L. Rushbrook	*(Hornchurch)*
11	Tug *Moorcock,* ⅜ in.	V. Greenwood	*(Thornton Heath)*
12	Tug *Cervia,* ⅜ in.	A. Locks	*(Meopham)*
13	M.V. *Royal Daffodil,* ⅛ in.	P. N. Foreman	*(Margate)*
14	P.S. *Lady Margaret,* 1/84	P. N. Foreman	*(Margate)*
15	Outboard cabin cruiser	A. V. Greatorex	*(Redhill)*
16	Fairmile Type C M.G.B., ½ in.	D. Metcalf	*(Ware)*
17	German patrol boat *Wiesel,* 1/40	A. D. Hindmarsh	*(Staines)*
18	Fairey Marine Huntsman 31, 1 in.	C. B. Ryan	*(N. Wembley)*
19	Vosper Viking cabin cruiser, 1/20	W. R. J. Chorley	*(Flitton)*
20	Coaster *Eden Fisher,* 1/100	R. J. F. Richardson	*(Hartlepool)*
21	Blue Star ship *Hobart Star,* 3/16 in.	F. R. Guffick	*(Romford)*
22	G.D.R. Ship *Augsberg,* 3/16 in.	F. R. Guffick	*(Romford)*
23	Thornycroft *Aurora* Steam Yacht, 1/12	P.Manzaroli	*(Richmond)*
24	M.V. *Velarde* fruiter, 1/200	W. H. Stubbs	*(Chiswick)*

CLASS F: Sailing Ships of any period (non-working)

No.	*Description*	*Name and Town*	
1	*Royal George,* 1756, ⅛ in.	J. Pheby	*(Beckenham)*
2	*Lilla Dan,* 1/50	J. S. Harper	*(London)*
3	Joo Seng Junk, ¼ in.	T. W. Dickey	*(Newtownabbey)*
4	*Cutty Sark*	J. W. Charlton	*(Gt. Yarmouth)*
5	Brigantine *Leon,* ⅛ in.	P. Puttock	*(Reading)*
6	*Seeadler,* 1/100	J. G. Hope-Murray	*(Wimbledon)*
7	French Xebec *Le Singe,* 1764, 1/75	E. P. Hertz-Smith	*(Tunbridge Wells)*
8	Clipper *Ariel,* 1865, ⅛ in.	J. Feasey	*(Bodmin)*
9	*Le Soleil Royal,* 1669, 1/100	A. D'Atri	*(Naples, Italy)*
10	*Henry Grace a Dieu,* 1540, 1/65	A. D'Atri	*(Naples, Italy)*
11	Thames Spritsail Barge, 1816, 1/40	D. W. J. Burchell	*(Sutton Coldfield)*
12	Endeavour Bark, 1768	K. F. Mitchell	*(London)*
13	*Santa Maria*	V. R. Bento	*(Bath)*
14	*Alert*	V. R. Bento	*(Bath)*
15	*Andromede*	V. R. Bento	*(Bath)*
16	*Cutty Sark,* ⅛ in.	A. D. Hindmarsh	*(Staines)*
17	French Slaver Brig *Ouragan,* 1830, 1/100	J. L. Gonzalez	*(Vizcaya, Spain)*
18	Long 12 pdr. gun in section of *Victory's* upper deck, 1/20	R. C. Tribbick	*(North Wembley)*

CLASS G: Working Yachts and Sailing Ships

No.	*Description*	*Name and Town*	
1	Chang-K'ou Ma-Yang-Tzu type Chinese Junk, 1/18	J. D. Bloom	*(Colchester)*
2	Wishbone Schooner	G. Walkley	*(Hornchurch)*
3	Thames Sailing Barge, ½ in.	P. Apps	*(Herne Bay)*
4	H.M. Brigantine *Dolphin 3,* 1836, 1/48	J. F. Mayger	*(Tadworth)*

CLASS H: Hydroplanes and Speedboats

No.	*Description*	*Name and Town*	
1	*Mistal,* OMR boat	P. B. Allen	*(Wokingham)*
2	*I Suffle 2,* OMR boat	P. B. Allen	*(Wokingham)*
3	*Cat o' Three Tails S*	P. B. Allen	*(Wokingham)*
4	*Wing Ding* R/C hydroplane	D. J. Collings	*(Bexley)*
5	Three-point offshore racer	C. B. Ryan	*(N. Wembley)*
6	Flow-motion, experimental model	M. R. Barker	*(Wellingborough)*

THE JOHN GRAY MEMORIAL TROPHY

Donated by the family of the late John Gray for the best Class N model by an entrant under 21.

L.B.S.C. MEMORIAL BOWL COMPETITION

A handsome trophy presented by public subscription by admirers of the late L. "Curly" Lawrence, known throughout the world as L.B.S.C., to be for a locomotive of his design, which will be judged on both appearance and performance.

THE MALTBY TROPHY

Donated by Mr. M. Maltby to be open for competition by Ship Model Societies exhibiting at the Model Engineer Exhibition.

J. N. MASKELYNE MEMORIAL TROPHY

To be awarded, at the discretion of the judges, for the model locomotive, in any scale, which does most to promote fidelity of design.

THE MAZE CHALLENGE CUP

Donated by Sir Frederick Maze, K.C.M.G., K.B.E., to be awarded annually for the best model of a sailing ship (pre-1820) or of an Oriental sailing craft of any period.

THE MODEL RAILWAYS BOWL

Presented by the proprietors of "Model Railways" for the best small gauge railway exhibit.

NEW ZEALAND CUP

Presented by the Model Societies of New Zealand for the best model of a locomotive based on a design by L.B.S.C.

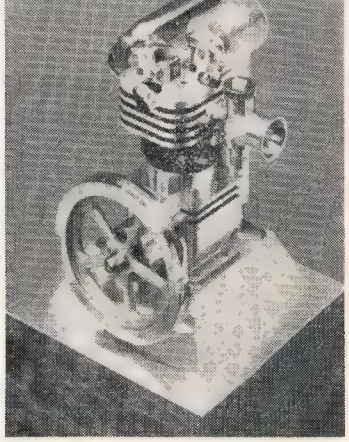
THE U.S.S.R. CENTRAL MARINE CLUB CHALLENGE CUP

Donated by the Council of Central Marine Club (U.S.S.R.). To be awarded annually to the Club whose exhibit represents the best achievement in marine model engineering

EDGAR WESTBURY MEMORIAL CHALLENGE TROPHY

Presented by the Society of Model & Experimental Engineers to be awarded at the discretion of the judges annually for originality and soundness of design in any type of prime mover, working plant in a marine craft, or fidelity to prototype of a working model i.c. engine

This attractive four-stroke engine has electronic ignition and a capacity of 40 c.c. It was built by engineering students at the Royal Signals and Radar Establishment (M.O.D.) at Malvern and is entered in Class K.



THE H. C. WHEAT CHALLENGE CUP

The H. C. Wheat Challenge Cup presented by his son in memory of H. C. Wheat 1877-1948 to be awarded annually for the best "O" Gauge Locomotive exhibited.

THE WILLIS CHALLENGE CUP

Donated by Mrs. Willis, in memory of her husband, to be awarded annually for the best exhibit in the Hydroplane and Speedboat Section.

CHAMPIONSHIP CUPS

In addition to challenge trophies a number of cups or other trophies are offered, where class numbers justify, to become the permanent property of the winners. Class trophies are offered as follows for the best:

I Locomotive
II Steam or Motor Vessel
III Sailing Ship or Yacht
IV Ship Miniature
V Mechanically propelled Road Vehicle
VI General Engineering Exhibit
VII Aircraft Model

STUDENTS' CUP

Awarded for any piece of amateur craftsmanship made collectively or individually by a class or member of a class of any school or technical college, or by a full-time engineering apprentice. The exhibitor (or exhibitors) must be under the age of 18 on 31 December, 1976.

SCHOOLS' COMPETITION

For boys under 16 who are still at school. Entries can be made individually or collectively provided that the competitors are under 16 on 31 December, 1976.

MARINE KIT CLASS

This is a new category this year, for models of any ships or boats built from commercial kits, for a prize kindly presented by A. G. Eames, Esq.

HOT AIR ENGINE COMPETITION

A competition to encourage the design and building of hot air engines is instituted at this Exhibition, for prizes generously given by A. N. Clark, Esq. Engines will be run for judging during the Exhibition, and awards made for horsepower output, workmanship, and design originality. The main requirement is that the swept volume of the working cylinder/s shall not exceed 5 c.c. No list of entries is included since a special entry date later than press date has been arranged; several entries have, however, already been received or promised.

COLONIAL CLASS

A special class for military figures of British and Dominion Armies 1857-1900 has also been introduced for this year only, and this too was given a special entry date which means that a list cannot be included; it can however be stated that support for the class is already strong.

GENERAL CONDITIONS OF ENTRY

1 Each entry shall be made on the official form and every question must be answered. Be sure to include the estimated value of your model.
2 All entry forms shall be accompanied by a remittance for the appropriate entry fee.
3 The entrance fee shall be 30p for seniors and 15p for under 16's.
4 A junior shall mean a person under 16 years of age on 31 December, 1976.
5 No exhibit which has previously won a bronze medal or higher award at any of the exhibitions promoted by this company shall be accepted for these Competitions. No model may be entered in more than one class.
6 No entry shall be accepted from a professional model maker.
7 The decisions of the judges shall be final.
8 Competitors shall state on the entry form:
(a) That exhibits are their own work and property.

CLASS I: Miniatures. Length of hull not to exceed: 9 in. for ⅛ in. to 1 ft. scale or larger; 10 in. for 1/16 in. scale; 12 in. for 1/12 in. scale; 15 in. for 1/32 in. scale. No limit for smaller scales.

No.	*Description*	*Name and Town*
1	Channel Fleet in Heavy Weather (three King Edward VII pre-Dreadnoughts), 1/1200	G. F. S. Winrow *(Birkenhead)*
2	Yacht *Mary*, 1660, ⅛ in.	K. Stuttard *(Birkenhead)*
3	H.M.S. *Nelson*, 1/1250	P. M. Baggaley *(Sidcup)*
4	*Hansa Cog*, c. 1350, 1/16 in.	E. P. Heriz-Smith *(Tunbridge Wells)*
5	Algerian Chebec, 1790	P. Jackson *(Bromley)*
6	Lugger, ⅛ in.	R. Hale *(Ilford)*
7	H.M.S. *Argonaut*, 1/600	A. Crisp *(London)*
8	U.S.S. *Alabama*, 1942, 1/600	A. Crisp *(London)*
9	H.M.S. *Canada*, 1916, 1/1080	N. Swales *(Doncaster)*

CLASS: Marine Kit Class — any ship or boat from a commercial kit

No.	*Description*	*Name and Town*
1	Crab Cutter, 1/25	J. L. Cundell *(Strood)*
2	Hjejlen paddle steamer, 1/50	G. A. Thompson *(London)*
3	*Wave Crest*	S. Byrne *(London)*
4	R.A.F. Crash Tender, 46 in.	D. V. Bonello *(Stanbridge)*
5	Submarine *U47*	D. J. Abbott *(Luton)*
6	H.M. Submarine *Repulse*, 1/200	R. Holden *(Hassocks)*
7	Mercantic coaster, 1/50	J. A. Power *(High Wycombe)*
8	R.A.F. Crash Tender	J. A. Power *(High Wycombe)*
9	M.F.V. *Valerie Anne* (converted Ton 12)	R. S. Goddard *(Rickmansworth)*
10	H.M.S. *Victory*, 1/600	D. C. Brown *(London)*
11	Drifter-trawler	A. A. King *(Huntingdon)*

CLASS J: General Engineering Models, working (including Stationary and Marine Engines)

No.	*Description*	*Name and Town*
1	4 h.p. Rotative Engine and Bank Mill	R. Jarvis *(Portland)*
2	Murdoch Aitkin Steeple Engine, 1840, 1 in.	R. F. Wakeford *(Staines)*
3	Centaur horizontal open crank oil/gas engine	F. J. Trentham *(Solihull)*
4	50 ft. Wheeled Fire Escape, 3 in	W. J. Parry *(Warlingham)*
5	Beam Engine, freelance, ¾ in.	A. H. Clarke *(Erdington)*
6	M.E. Beam Engine, 1 in.	D. W. Chatterton *(Sale)*
7	Vertical Columnar Steam Engine, 1/10	T. D. Walshaw *(Kendal)*
8	4-column Beam Engine, c. 1/12	T. D. Walshaw *(Kendal)*
9	V-4 Oscillating Steam Engine	A. V. Greatorex *(Redhill)*
10	Condensing Beam Engine, 2 in	F. L. Folkard *(Oxhey)*
11	40 mm. Bofors Light A.A. Gun, 1½ in.	J. Clancy *(New Romney)*

CLASS K: Internal Combustion Engines (working)

No.	*Description*	*Name and Town*
1	Sealion 30 cc. 4 cyl. o.h.v. engine	A. Spencer *(Corby)*
2	7-cyl. Radial Engine, 5.6 cc.	P. Biggs *(Poole)*
3	40 cc. engine, electronic ignition	Royal Signals & Radar Establishment Students *(Malvern)*
4	2.5 cc. Racing Aircraft Diesel Engine	B. Fairey and K. Parent *(Ontario, Canada)*

CLASS L: Mechanically Propelled Road Vehicles, working (including tractors)

No.	*Description*	*Name and Town*
1	Burrell Traction Engine, 3 in. scale	M. Worthington *(Buxton)*
2	*Minnie* Traction Engine, 1 in. scale	G. M. Waugh *(Sunderland)*

3	Savage/Darby Broadside Digging Engine, 2 in. scale	C. R. Tyler	*(Reading)*
4	Minnie converted to Showman's Engine, 1 in. scale	G. S. Hills	*(Clacton on Sea)*
5	Allchin *Royal Chester,* 1½ in. scale	A. B. Milne	*(Goring)*
6	Fowler Supreme Showman's Road Locomotive, 2½ in. scale	A. L. Pattett	*(Goring)*
7	Aveling & Porter Roller, 2 in. scale	M. E. Sparkes	*(Hornchurch)*
8	Foden 6-ton End Tipping Wagon, 3 in. scale	J. R. Sykes	*(Huddersfield)*
9	Traction Engine, 2 in. scale	G. Munday	*(Oakham)*
10	Single-deck Clerestory-roof American 4-wheel streetcar, 1/48 f/s	D. G. Newton	*(Sittingbourne)*
11	Modified *Minnie* Traction Engine, 1 in. scale	C. J. Hainge	*(Oxford)*
12	*Minnie* Traction Engine, 1 in. scale	J. P. I. Cole	*(Enfield)*
13	Radio-controlled JPS Lotus, ⅛ f/s	P. R. Seth-Smith	*(Sittingbourne)*
14	Hymac Excavator, radio-controlled	J. Lore	*(London)*

CLASS N: Tools and Workshop Appliances

No.	*Description*	*Name and Town*	
1	Quorn Tool & Cutter Grinding Machine	I. Strugnell	*(Loughton)*
2	Tool Grinder	E. Baigent	*(Windlesham)*
3	Rear Tool Post	S. H. Willetts	*(Lydney)*
4	Grinder	S. H. Willetts	*(Lydney)*
5	Swing-over Boring Tool Holder (Cleave)	D. J. Wilson	*(Camberley)*
6	Drill Grinding Jig (Duplex)	D. J. Wilson	*(Camberley)*
7	Rotary Table	N. Marshall-Potter	*(Welwyn Garden City)*
8	Keyway Broaching Press	N. S. Hemingway	(Rochdale)
9	Quorn Tool & Cutter Grinder	H. R. Maisey	*(Coulsdon)*
10	Small Swivelling Vise	J. C. H. Haley	*(Wembley Park)*
11	Sheet Metal Folder	J. C. H. Haley	*(Wembley Park)*
12	Toggle Press	J. C. H. Haley	*(Wembley Park)*
13	Pedestal Grinder	A. Baker	*(Lydney)*
14	½ in. Sensitive Drill & Vise	A. Baker	*(Lydney)*
15	Power Hacksaw	A. Baker	*(Lydney)*
16	3½ in. Lathe	I. Rose	*(Lydney)*

CLASS O: Engineering Scale Models (non-working)

No.	*Description*	*Name and Town*	
1	Gurney Steam Carriage, 1 in. scale	W. Stokes	*(Basildon)*
2	Birel Go-Kart, 3 in. scale	A. McVean	*(Goring)*
3	AEC Regent Bus Chassis, ¾ in. scale	M. E. Hart	*(Wells)*

CLASS P: Scenic and Representational Models (including Architecture)

No.	*Description*	*Name and Town*	
1	Mail Coach & Workshop, c. 1870, ½ in. scale	G. C. E. Blackman	*(Watford)*
2	Terrace of 19th Century Houses, 1/148 f/s	R. Chitham	*(Hawkhurst)*
3	The Watchers — 1920s Bakery, 1/32	J. D. Wilmshurst	*(Maidstone)*
4	De Klok Dutch Street Organ, 1 in scale	J. Maundrell and Miss J. Howard	*(Bedfont)*
5	89-key Gaudin Fairground Organ	J. Maundrell	*(Bedfont)*

(b) Any parts or kits which were purchased or were not the outcome of their own work.
(c) The origin of the design.

9 Models will be insured for the period during which they are at the Exhibition and in transit to and from the Exhibition, provided they are adequately packed and the instructions regarding their despatch are correctly observed.

10 Model & Allied Publications Ltd., reserve the right to refuse any entry or model on arrival at the Exhibition and shall not be required to furnish any reason for doing so.

11 Model & Allied Publications Ltd., reserve the exclusive right to describe and photograph any models entered for competition or display and to make use of any such photograph or descriptions in any way they may think fit.

12 Competitors will be issued with a free non-transferable Competitor's Pass to the Hall during the Exhibition.

STAND HOLDERS

Stand 1

North London Society of Model Engineers has been continuously active since its formation in 1945 and now has a membership of over 150. It has, on private ground, a continuous track of some 800 yards for 3½ in. and 5 in. gauge and a shorter track for 2½ in., 3½ in. and 5 in. gauge. The Society organises an annual open regatta for power boats and open Electric Car meetings on its 100 ft. track. This is on Club premises which also includes a meeting room and library. For further particulars, times of meetings, etc., please consult the Steward on the stand or write to the Secretary: M. J. R. Radford, 80 Holden Road, Finchley, London, N.12.

Stand 2

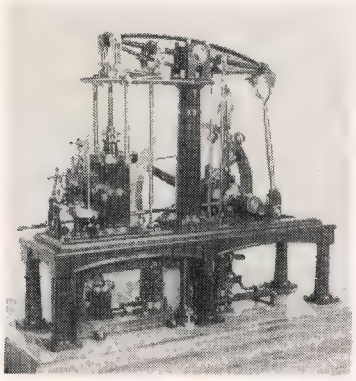
Held Products.

Stand 3

This is the first year that Model and Miniature Railways have decided to take part in this Exhibition and we hope to continue in the future. With regard to the model railway side we will be showing a wide range of equipment, ranging from "N" gauge up to "O" gauge, with many of the "O" gauge items being our own manufacture. On the model engineering side we will be bringing a vast range of materials, including rivets, nuts, bolts, tools and also castings. As some of these items are rather heavy we should be obliged if you would contact us and we can bring the necessary castings for you. We would like to take this opportunity of welcoming new customers and also meeting many of our present customers.

Stand 4

We at Precision Petite are always very pleased to introduce new products for the modeller; this year we have up-graded our mini drill to produce more speed and more torque, and running side by side the first viewing of our new Super mini drill to allow drills up to 3.5 mm. with four collet sizes. We also have for the plastic kit enthusiasts a very interesting tool that will make glueing old fashioned, so don t forget to get around to see us and try our new "goodies".



Beam engines are popular subjects for modelling. This example of a condensing engine by F. L. Folkard is partly based on an engine in the Royal Scottish Museum, Edinburgh. Perspex panels are fitted to the water tank to show the interior. Exhibit number is J10.

Stand 5

"Train Time" (Goodyear Models of Huddersfield) is the establishment which specialises in handbuilt models and vintage toys for the collector. The shop, situated in an elegant Victorian arcade, has the largest stocks of pre-war stock outside London with particular emphasis on the classic railway models produced by Hornby, Bassett-Lowke and the German firms of period. A detailed comprehensive mail order list is published for those unable to make the journey north. "Train Time" are sole agents for the products of Goodyear Models. This firm specialise in the production of custom-built models for collectors and museums and manufactures a range of 7 mm. scale goods and passenger rolling stock. Goodyear Models also undertake professional restoration work on pre-war toys for private collectors and museums.

Stand 6

Western Models.

Stand 7

The Electric Car Racing Association is the controlling body for slot racing model cars in the U.K. Cars to E.C.R.A. standards are used at slot racing clubs throughout the U.K.; these usually meet weekly. Members can also enter the annual National Championships. The display on the stand gives some impression of slot racing, but cannot convey the sport fully as club tracks are generally much larger than the stand. More details of your local club are available from the stand, or from the E.C.R.A. secretary, Mr. C. Frost, 22 Phillips Road, Marnhull, Sturminster Newton, Dorset DT10 1LF.

Stand 8

The "Bottle Chopper" is the original all-metal, easily assembled precision tool, which will cut bottles accurately. As shown on B.B.C. television's "Tomorrow's World". Recycles "No Deposit" bottles into useful household items. Makes glasses, tumblers, vases, fruit bowls, goblets, napkin rings, candle holders, etc. The only handicraft using free raw materials. Kit includes full instruction leaflet with diagrams for assembly, tapping hammer and six-wheel tungsten cutting tool.

CLASS Q: Horological, Scientific and Optical Apparatus

No.	*Description*	*Name and Town*
1	Wilding 8-day Wall Clock	A. F. Lewry *(Crowborough)*
2	Congreve Rolling Ball Clock	R. B. Thomas *(Wantage)*
3	8-day Wall Clock	M. R. Shaw *(Bradford)*
4	8-day Striking Miniature Bracket Clock	C. B. Reeve *(Hastings)*
5	Weight-driven Clock in Perspex	C. Houthuesen *(Sunbury-on-Thames)*
6	Quartz-crystal Battery Bracket Clock	Dr. K. L. Smith *(Canterbury)*
7	9 in. Induction Coil	E. P. Hyatt *(South Croydon)*
8	Repeating Bracket Clock	L. Sowerby *(London)*
9	John Harrison's No. 1 Marine Timekeeper	L. Salzer *(Biggin Hill)*
10	Sunshine Recorder	P. Kemp *(Ashford)*

CLASS R: General Craftsmanship not otherwise classified

No.	*Description*	*Name and Town*
1	East Anglian Waggon	G. B. Eurich *(East Haddon)*
2	Rudge Rotary Tricycle, c. 1880, 1/16 f/s	C. F. Adams *(Ruislip)*
3	MacMillan's Bicycle, 1839, ⅛ f/s	W. Reeman *(Northolt)*
4	Hedge's Boneshaker, 1869, ⅛ f/s	W. Reeman *(Northolt)*
5	Colt 45 Frontier model, 1872	G. S. Hills *(Clacton on Sea)*
6	Kentish Turnwrest Plough, 1½ in. scale	S. S. Curd *(Bridge Green)*
7	Grand Prix Car, 1/43 f/s	M. Bishop *(Rochford)*
8	Farm Cart, ⅛ f/s	G. C. Robertson *(Buntingford)*
9	Sussex Plough, ⅛ f/s	G. C. Robertson *(Buntingford)*
10	Hereford Plank-sided Farm Waggon, ⅛ f/s	R. G. Templar *(New Malden)*
11	Tipping Dung Cart, ⅛ f/s	R. G. Templar *(New Malden)*
12	Brougham Carriage	A. A. King *(Huntingdon)*
13	1912 Renault	C. E. Brewer *(Ingatestone)*
14	Milk Float, c. 1920, 1 in. scale	P. E. Hingston *(Wantage)*
15	Chess Set	M. Davis *(Oxted)*
16	Chessmen & Board	K. Bryant *(Crawley)*
17	Cased set of Duelling Pistols	D. Watts *(Brightlingsea)*
18	Scotch Tip Cart, ⅛ f/s	R. Matchett *(Bexleyheath)*
19	Royal Mail Coach, 1800	T. B. Pollard *(Birkenhead)*
20	North Monmouthshire Farm Waggon	R. J. Hawes *(Morden)*
21	Flint-lock Pistol	Mrs. S. J. Hill *(Knighton)*
22	Reading Gypsy Caravan, 1 in. scale	J. Smith *(Whitstable)*
23	Leyland National Commuter Coach 1/20 f/s	N. M. Grace *(Sittingbourne)*
24	Ebony & Ivory Desk Paperweight	T. D. Walshaw *(Kendal)*
25	Decorated Ivory Box and Lid	T. D. Walshaw *(Kendal)*
26	Oval Ivory Box and Lid	T. D. Walshaw *(Kendal)*
27	Don Prudhomme's Rear-engined Dragster, 1/16 f/s	C. Davis *(Croydon)*
28	Surtees TS16 F1 Car, 1/32 f/s	C. Davis *(Croydon)*
29	Farm Tip-cart, ⅛ f/s	B. A. Rutherford *(London)*
30	Farm Waggon, Essex type, ⅛ f/s	R. E. Piddington *(London)*
31	Freelance Dragster in Meccano	H. J. Halliday *(London)*
32	Group of welded figures etc. Robin Hood and Little John, Long John Silver, Rocking Chair, Escape, Old Car, and Cannon	C. Harris *(Benfleet)*
33	Wallis & Steevens Engine and Fairground in Embroidery	C. and P. Osland *(Pewsey)*
34	98-key Marenghi Organ — Embroidered Picture	C. and P. Osland *(Pewsey)*
35	Garage Scene, 1/24 f/s	E. F. Bolton *(Wimbledon)*

CLASS S: Junior Section. For any type of model or mechanical work except military subjects) by a junior under the age of 16

No.	*Description*	*Name, Age and Town*
1	Trojan Double-acting Steam Engine	B. W. Wood (12) *(Amersham)*
2	Avro York Flying Model, 1/72	P. L. Jenkins (15) *(Ruislip)*
3	Black Panther Drag Racer, 1/25	M. Davis (14) *(Croydon)*
4	B.R.M. P153 Car, 1/43	M. Bishop (15) *(Rochford)*
5	Panther	P. Wylie (8) *(London)*
6	Prehistoric Scene	M. Wylie (10) *(London)*
7	Matchstick Boat	P. Stokes (9) *(Basildon)*
8	Race-car Diorama, 1/12	J. S. Reynolds (13) *(Bristol)*
9	1912 Ford Model T, 1/32	S. Law (13) *(Saffron Walden)*
10	Kloudrider R/C Sailplane	M. Duhig (14) *(Gravesend)*
11	Hawker Typhoon 1B, 1/32	A. Wilkins (13) *(Hoddesdon)*
12	Spitfires Mk. Vb & Vc, 1/72	A. Wilkins (13) *(Hoddesdon)*
13	1960 500 cc. Manx Norton, 1/9	J. Calder (12) *(London)*
14	B.M.W. Racing Combination, 1/9	J. Calder (12) *(London)*
15	Livery Stable	Miss S. J. Hullis (11) *(Ipswich)*
16	Group of Waterline Warships, 1/1200	L. P. Wettern (12) *(Westerham)*
17	Clarkson 2 in. Vertical Engine	A. Jenkins and R. Summerfield (15) *(Ruislip)*
18	1927 Bugatti 35B	C. A. Reynolds (13) *(Sutton Coldfield)*
19	Viking Ship	A. P. Boyne (14) *(West Ewell)*
20	Evening Star Locomotive, 4 mm.	J. Walshaw (8) *(Kendal)*
21	Cinque Ports Ship	C. J. Burchell (14) *(Sutton Coldfield)*
22	Woodstead Station Building, 00 gauge	C. French (13) *(Teignmouth)*
23	*Tirpitz*	S. French (11) *(Teignmouth)*
24	Plymouth Power Dragsters, 1/24	S. N. Pentin (14) *(Pinner)*
25	Thatched Cottage, ¾ in.	M. & N. Warwick (15, 12) *(Crawley)*
26	Stonehenge	J. C. Porter (9) *(Edenbridge)*
27	Modified Dore-Westbury Light Vertical Milling Machine	J. Ofield (15) *(Huntingdon)*
28	A1 Glider	G. Dowsett (14) *(Ruislip)*
29	Railway Works Scene, 00	R. Constable (11) *(London)*
30	M.F.V. *Eileen*, ½ in.	A. B. Smith (15) *(Beeston)*
	On the Romford & Dagenham M.B.C. Stand:	
31	Nigerian Corvette F81	P. Ashton (12) *(Romford)*
32	*Bismarck*, 3/32 in.	P. D. Bailey (12) *(Romford)*
33	H.M.S. *Hadleigh Castle*, ⅛ in.	M. Bone (11) *(Romford)*
34	Coaster	P. Cotgrove (11) *(Romford)*
35	Vedette Frigate (mod.)	B. J. Dove (11) *(Romford)*
36	H.M.S. *Prince of Wales*, 3/32 in.	S. Finch (00) *(Romford)*
37	Iranian Corvette	D. Gordon (15) *(Dagenham)*
38	P.S. *Jeannie Deans*/H.M.S. *Repulse*	Miss C. Marin (10) *(Chadwell Heath)*
39	*Golden Hind*	Miss K. E. Bailey (8) *(Chadwell Heath)*
40	H.M.S. *Bounty*	Miss E. Spector (10) *(Dagenham)*
41	River Gunboat *Ladybird*	Miss E. Spector (10) *(Dagenham)*
42	B.P. Tanker/U.S. Submarine	D. Marin (11) *(Chadwell Heath)*

Stand 9

The Southern Federation of Model Engineers is the stand that for many years has been the mecca for the average model engineer. This year the Northern and West Midland Federations are also represented. Details of all clubs in your area can be obtained at the stand. The stewards are there to help with model engineering problems; don't hesitate to ask — if your query cannot be answered at once then a written reply will be sent. The stand also features demonstrations of various types and this year boilermaking techniques will be demonstrated. Many fine models are on show and also there is always something for the younger visitors to get interested in. So if you want to know anything, ask here!

Stand 10

The Harrow and Wembley Society of Model Engineers was formed in 1936 and holds its meetings at The B.R. Sports Pavilion, Headstone Lane, Harrow.

The Society has approximately 100 members, whose interests are very varied. There are two live steam tracks. One caters for 2½, 3½ and 5 in. gauges and is raised. The other is for 3½, 5 and 7¼ in. gauges and is ground level.

Stewards will be on duty throughout the Exhibition to answer any questions

Stand 11

Welling and District Model Engineering Society, formed in 1945, now has a membership of 80, and caters for all aspects of Model Engineering. Meetings are held twice monthly, with guest speakers; film and slide shows are regular features. The Society's portable track for 3½ in. and 5 in. gauge is used extensively in the summer for local fetes. A permanent continuous track which on completion will give a 1,400 ft. run for 3½ and 5 in. gauge is under construction at Falconwood, Rochester Way. New members are welcome and further details and membership forms are available from our stand.

Stand 12

Miracle Bond (Avdel), the one-drop instant adhesive, is the fantastic space-age adhesive for all household and dozens of other jobs, such as cars, boats, jewellery, antiques, caravans, spectacle frames, glassware, etc. The list of items for repair is too vast to list here. Miracle Bond is a phenomenal bonding glue as used and developed from the N.A.S.A. space research agency in connection with the Apollo Moon Projects. By nature of its formula it is able to join most similar or different materials to each other, i.e. metal to wood, rubber to glass, etc.

Stand 13

J. M. Hick's stand will be giving demonstrations of perhaps the oldest form of mechanical model making, the construction of working miniature small arms, which dates from 1580 when wheellock pistols 2 in. long were made in Nuremberg. A handful of makers continue the craft today; David Hick is one of the few professionals. With tightening restrictions on the collection of firearms and the making of full-size replicas, the interest in miniatures is growing everywhere. Some work of other members of the British Miniature Arms Society is also shown. No exhibit infringes the firearms regulations in any way.

Stand 14

Malden & District Society of Model Engineers was founded in 1936 when the Society operated a track as part of the Holidays at Home Scheme in Beverley Park, New Malden, and in later years obtained a long lease on its present site in Thames Ditton where a raised track caters for 3½ in., 5 in. and 7¼ in. locomotives while itself being surrounded by a large ground

level 7¼ in. layout. On their stand will be models and exhibits representing a wide cross section of model engineering activities as well as a workbench where members will be showing various simple model engineering tasks. The principal feature of their stand is an attractive 7¼ in. gauge Virginia named "George Washington".

Stand 15

The Model Yachting Association is the controlling body for vane and radio-controlled yachts in England and Wales. Examples of various classes of racing models will be on display, showing the size range of the four principal racing classes, and a steward will be in attendance to provide information and advice. Sailing craft are probably the oldest form of working models, but development is still taking place and model yachting is enjoying a considerable growth in popularity.

Stand 16

Lancaster Modelcraft.

Stand 17

Stuart Tools.

Stands 18/19

A large and diverse range of model-making equipment and ancillary items will be seen on Stand Nos. 18/19. Apart from the full range of Badger airbrushes and accessories, Morris and Ingram are exhibiting the following items for which they are distributors: Williams Bros.: Highly detailed model kits of radial engines and World War I and II aircraft equipment. Old Guard: 54 mm. military models from every period as well as a range of miniatures for wargamers. Osprey Books: Men-at-Arms series of military uniforms and reference books.

Stands 20/21

Boxford Machine Tools Ltd. manufacture a range of eight types of 10 in. swing lathes in two lengths of bed, catering for educational users with the basic training lathes and underdrive lathes, to the heavier duty industrial variable speed range machines. Boxford bench model types have been popular with model engineers over the years, and with the wide range of accessories available, practically all jobs including milling and gearcutting can be achieved with this machine. Now Boxford has introduced the bench model machine in the form of the M.E.10, a 10 in. swing screwcutting lathe built specifically for the model engineer at a price of £485. Come and see the M.E.10 on stands 20 and 21 and appreciate the value for money this machine offers. Also on the stand will be Boxford's infinitely variable speed milling machine and model 500 VSL lathe.

Stand 22

SAVO Electronics Ltd. is the manufacturing licensee for the world's most complete and oldest line of metal detector equipment, White's Electronics, Inc., U.S.A. Land, underwater, industrial, commercial and leisure time products are all included in the line. An exceptional help to military battlefield enthusiasts. A hobby which gives enjoyment, exercise and a potential profit. Enjoy this new boom market as a user or dealer. Dealer enquiries welcome.

Stand 23

International Plastic Modellers Society.

Stands 24/25

Argus Books Ltd.

43	H.M.S. *Grenville,* 3/32 in.	D. Marin (9) *(Chadwell Heath)*
44	Cruiser *Prinz Eugen*	I. Plummer (12) *(Barking)*
45	Depot Ship *Saar*	B. Plummer (9) *(Barking)*
46	Pocket Battleship *Lutzow*	P. Spector (00) *(Dagenham)*
47	Vickers Vedette	S. J. Snell (11) *(Romford)*
48	Pocket Battleship *Graf Spee*	R. Thick (11) *(Romford)*
49	H.M.S. *Black Prince,* ⅛ in.	P. Tilbrook (11) *(Chadwell Heath)*
50	Leander Class Frigate, 3/16 in.	J. Tilbrook (11) *(Chadwell Heath)*
51	*Bismarck*	G. A. Wignall (13) *(Chadwell Heath)*
52	H.M.S. *Queen Elizabeth,* c. 1913, 3/32 in.	P. Wilding (11) *(Romford)*
53	H.M.S. *Viking,* Destroyer, c. 1908	R. Law (11) *(Romford)*
54	Flattie Speedboat	A. Smith (13) *(Romford)*
55	Ton Class Minesweeper	D. Brettell (9) *(Romford)*
56	Inshore Minesweeper	R. Berry (7) *(Romford)*
57	H.M.S. *Malcolm*	A. Garnham (7) *(Romford)*
58	Elizabethan Galleon	Miss J. Doman (11) *(Romford)*
59	Bay Class Frigate	M. Doman (10) *(Romford)*
60	Ford Class Seaward Defence Boat	G. Doman (7) *(Romford)*

CLASS AA: Flying models of all types: free flight, control-line and radio control

No.	*Description*	*Name and Town*
1	International Competition Glider	W. Simms *(Esher)*
2	International Competition Rubber Model	J. Buskell *(Claygate)*
3	Sky Princess Mk III	T. G. Beatson *(Manchester)*
4	A2 Glider Safir	R. K. Newman *(Crawley)*
5	Red Star, Control-line model	C. Chantrell *(Edinburgh)*
6	Radio-control Trainer	J. Coughlin *(London)*
7	Freelance 4-engine Transport	A. J. P. Briggs *(Tadworth)*
8	Cobra, Control-line Trainer	C. Chantrell *(Edinburgh)*
9	Pylon-racing R/C Glider	G. J. Rae *(Great Malvern)*
10	Leprechaun Glider	B. Norcross *(Burnley)*
11	Wakefield/F.A.I. Rubber Model	I. Dowsett *(Ruislip)*
12	Elmira R/C Glider	J. D. Michie *(Windlesham)*

CLASS AB: Scale flying models of all types, rubber, glider, power, control-line or radio control

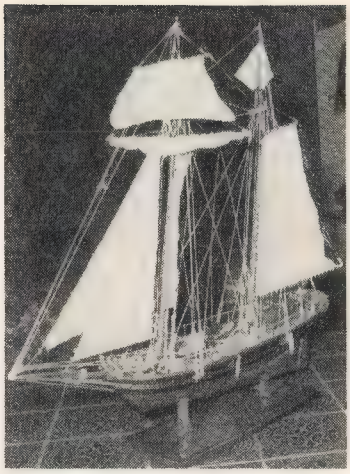
No.	*Description*	*Name and Town*
1	Electric-powered Avro York	P. L. Jenkins *(Ruislip)*
2	1910 Dunne D8 Pusher, R/C, 1/10	R. J. Parkhouse *(Harpenden)*
3	Hawker Hurricane Mk. IIc, 1⅝ in.	P. Coombe *(Tunbridge Wells)*
4	Westland Lysander, 1 in.	G. Maull *(Colchester)*
5	Hansa Brandenburg D1, 1/20	R. Morgan *(Cheltenham)*
6	Focke-Wulf Fw 190a, 1/7	B. R. Bundock *(London)*
7	F.E.26 (Royal Aircraft Factory) 1¾ in.	J. Larter *(Ripley)*
8	Model of Proposed Man-Powered Aircraft, 1/20	G. R. Hill *(Knighton)*
9	Luscombe 8A Sky Pal	T. G. Beatson *(Manchester)*
10	Nieuport 24, 1 in.	M. Stockdale *(Colchester)*
11	D.H.60 Gipsy Moth Jason, 1/17	J. K. Adams *(London)*
12	S4 Kania-3, R/C, 1⅜ in.	K. Jones *(Lydney)*
13	Boeing B17G Fortress, 1/16	A. J. P. Briggs *(Tadworth)*
14	Hawker Hurricane Mk. 1, 1/7	D. Tilley *(London)*

CLASS AC: Scale non-flying models

No.	Description	Name and Town
1	Spitfire, 1/10	G. M. Waugh *(Sunderland)*
2	Messerschmitt Me 163B, 1/32	A. M. Ward *(London)*
3	Spitfire in wood and brass	C. J. Kitcher *(Caldicot)*
4	Concorde in wood and brass	C. J. Kitcher *(Caldicot)*
5	A7 D/E Corsair IIs, 1/72	D. L. Bailey *(Camberley)*
6	Mark 52 Harrier Demonstrator, 1/24	D. L. Bailey *(Camberley)*
7	Junkers Ju 87B/TROP, 1/24	M. Philpot *(Maidenhead)*
8	General Dynamics FIIIE, 1/72	S. E. P. Jerrett *(Newbury)*
9	Boulton & Paul Overstrand, 1/72	E. J. Vine *(Bexleyheath)*
10	Slingsby Tutor, 1/72	L. H. Haynes *(Northwood)*
11	American Eagle Eaglet, 1/72	L. H. Haynes *(Northwood)*
12	Chilton DW1A, 1/72	L. H. Haynes *(Northwood)*
13	Catapult launch from H.M.S. *Ark Royal,* 1/48	F. P. Lagier *(Salisbury)*
14	Harrier Dispersal, 1/48	F. P. Lagier *(Salisbury)*
15	Lysander/Resistance Contact, 1/72	Alleyn Court Preparatory School *(Southend-on-Sea)*
16	F-16, 1/48	M. Bishop *(Saffron Walden)*
17	D.H.85 Leopard Moth & D.H. 80a Puss Moth, 1/36	A. F. Woollett *(Wokingham)*
18	The Last Moths — two D.H. 94s, 1/36	A. F. Woollett *(Wokingham)*
19	North American P51-D Mustang, 1/48	P. T. Willes *(Lowestoft)*
20	Saro London II, 1/73	N. J. Olliff *(Odiham)*
21	Dassault Super Mystere B2, 1/72	N. J. Olliff *(Odiham)*
22	Westland Lysander, 1/35	D. Gardiner *(Kingston on Thames)*
23	U.S. M.C. Harrier, 1/48	D. Gardiner *(Kingston on Thames)*
24	Lancaster Scene, 1/48	D. C. Boyne *(Ewell)*
25	North American Mustang Mk. 1, 1/48	D. Maycock *(Uxbridge)*
26	Short C Class Empire Flying Boat, 1/72	K. Wagner *(Camberley)*
27	Harrier Pair, 1/24	A. A. P. Lloyd *(London)*
28	Hawker Hurricane, 1/24	A. Miller *(Woodford Green)*
29	Supermarine Southampton Mk. 1, 1/76	C. Brasted *(Lymington)*
30	TSR2; 1/72	P. L. Robinson *(Rochdale)*
31	Grumman EA68 Prowler, 1/48	P. S. G. Bacon *(Walton on Thames)*
32	LTV Corsair II, 1/72	G. F. Wright *(Sutton Coldfield)*
33	1911 Bristol P1 Monoplane, 1/32	J. A. Nicklin *(Sutton Coldfield)*
34	Gloster Gladiator, 1/72	N. Owen *(Birmingham)*
35	Hawker Tempest II, I.A.F. c. 1950, 1/72	N. Owen *(Birmingham)*
36	F82G Twin Mustang, 1/72	N. Owen *(Birmingham)*
37	Boeing 247, 1/72	G. F. Wright *(Sutton Coldfield)*
38	Bristol Boxkite, 1/48	V. Cook *(Swindon)*
39	Maurice Farman Longhorn, 1/72	V. Cook *(Swindon)*
40	Lockheed P2 Neptune, 1/72	P. Newman *(Greenford)*
41	1976 Battle of Britain Flight Spitfires, 1/72	R. J. Swindin *(Ipswich)*
42	D.H. Tiger Moth, 1/48	K. Gardner *(Hatch End)*
43	McDonnell-Douglas F4F Phantom II, 1/72	A. Constable *(London)*
44	B.A.C. Lightning F6, 1/72	A. Constable *(London)*
45	General Dynamics F16A, 1/48	A. Constable *(London)*
46	Gloster Meteor F Mk. IV, 1/72	A. Constable *(London)*

CLASS AF:

No.	Description	Name and Town
1	240 watt Proportional Speed Controller	W. R. J. Chorley *(Flitton)*



Period ships have made somewhat of a return to popularity, helped to some extent by the superb kits being made in Italy and Spain. The revenue cutter *Alert,* exhibit F14, by V. R. Bento is a typical example of a small prototype.

Stand 26

P and A Models, Model Aircraft, Scenic Accessories for Railways, Dioramas, Villages, Yachts, Boats, etc. Manufacturers of a wide range of fibreglass products for the model world. Our present range includes yachts, aircraft and scenic accessories for railway modelling. We build to a high degree of accuracy and quality giving value for money. You will see on our stand "Playaway" 36 in. model racing yacht sold in kit form or as separate parts. P and A sails are made from top quality terylene in various colours. Quotations are given for Marblehead Class suits on request. Our range also includes brass fittings and yacht sundries.

Stand 27

Allcraft Enamellaire Ltd.

Stands 28/29/30/31

N. Mole & Co (Machine Tools) Ltd. of Watford will again be attending the Exhibition, and showing a large range of machine tools of special appeal to the model engineer. These will include lathes manufactured by Myford, Boxford and Emco, drilling machines, and milling machines, etc. The "Amolco" lathe milling attachment will be on demonstration, and the new small bench type "Amolco" vertical milling machine will be shown for the first time. A warm welcome will be extended to all customers both old and new, so make a point of visiting stands numbers 28, 29, 30 and 31, where we feel sure that you will see plenty that will interest you.

Stand 32

Railmail of Watford.

Stands 33 & 40

The Model Engineer Exhibition would have something missing if Myford Ltd were not showing because the name MYFORD is synonymous with Model Engineering. They will be exhibiting the Series 7 Lathes, namely the ML.7 and Super 7 which are the first choice of Model Engineers in all parts of the world. They will also be showing the popular ML.10 Metal Turning Lathe and the latest addition to the MYFORD range, the 280 Centre Lathe. Other exhibits will include the ML.8 Woodworking Lathe together with examples from the range of metal working accessories, etc. The produc-

tion of MYFORD Lathes is a precise, complex operation but the objective is simple — to provide a dependable, accurate and versatile machine at the lowest possible cost. In the production of MYFORD Lathes full advantage is taken of a system of jigs, fixtures and gauging units in order to provide the maximum degree of interchangeability which results in the ease with which replacement parts may be fitted. So far as quality is concerned, MYFORD Lathes have gained appreciably from the fact that they are manufactured in the same plant alongside the range of Precision Cylindrical Grinding Machines. Experienced demonstrators will be operating the Metal Turning Lathes during the exhibition.

Stand 34

Michael Holden Associates Ltd. are showing working steam models, made by engineering craftsmen, comprising traction engines, stationary engines and stationary plant on Stand 34. From their works at Banbury, Oxfordshire, are produced ¾ in. scale Agricultural Traction Engines, Showman's Tractors and Road Locomotives — al fired by coal or gas — also Portable Engines. These collectors' machines are based on the engine produced by Wm. Allchin of Northampton, around the turn of the century, and are available to order in kit form, as fully machined parts, or completed. Also on display is the Burrell Scenic Showman's Road Locomotive which commences production in April.

Stands 35/36

Euro-Models of Twickenham are importers and trade distributors of high quality wooden boat kits, period and modern, from Europe's leading manufacturers. There will be demonstrations of the Aeropiccola Vibro-fretsaw which will cut almost anything except your fingers, and really superb twin- and triple-cylinder marine engines with self-pressurising boiler/burners plus thrilling new radio control for tank kits in 1:35, 1:15, 1:24 scale.

Wooden and brass cannon kits are featured, together with a host of period and modern boat fittings offered for sale. There will also be fine timbers for modelling, i.e. lime, box, walnut, cedar, beech, mahogany. Many hand tools are offered, including those from Xacto, Dremel and Bonum of West Germany. Centrepiece of the stand will be a 51 in. model of H.M.S. *Victory* built from the Sergal kit, and other handsome models from kits by Steingraeber, Aeropiccola, Mantua, France Maquettes, Corel and Art amb Fusta.

Stand 37

Elliott Machine Equipment Ltd.

Stand 38

A. E. King (Tools) Ltd., has been a regular advertiser in the *Model Engineer* for over 20 years. This is the first time we have had a stand at the M.E. Exhibition. On show will be sets of Dormer drills, taps and dies, reamers and milling cutters. Also a full range of small tools useful to the model engineer, such as machine vices, lathe and drill chucks, squares, scribers and punches, endmills, lathe centres, sets of spanners, micrometers and verniers, dial gauges and sets of Allen keys. All tools on show will be for sale, including special offers during the Exhibition only. 3 Central Parade, Station Road, Sidcup, Kent.

Stand 39

On this stand Rhodes Flamefast Ltd. will show for the first time at this Exhibition their latest range of Flamefast workshop equipment. The range includes brazing hearths, gas forges and crucible metal melting furnaces, all of which are fitted with whisper-quiet air blowers and have a host of other practical features including inherent safety of operation. In addition, Adapto torches will be shown, ranging from the precision Needle-flame torch suitable for

CLASS MA: Diorama. Composition in diorama form of figures, scenery etc. of Military, Naval, or Air Force character

No.	*Description*	*Name and Town*
1	Mounted Band 2nd. Life Guards c. 1853, 54 mm.	A. S. Proctor *(Barnet)*
2	"Renegade", 1/35	C. Barrington-Brown *(Salisbury)*
3	"99% Waiting 1% Action", 1/35	C. Barrington-Brown *(Salisbury)*
4	"I get by with a little help from my friends", 1/35	*(Salisbury)*
5	French Eagle Bearer and Escort 1813, 54 mm.	J. Stratton *(Crawley)*
6	Old Guard at Waterloo, 30 mm.	J. Stratton *(Crawley)*
7	Welcome Encounter, 54 mm	D. J. Sullivan *(London)*
8	The Dispatch	D. J. Sullivan *(London)*
9	"Your Horse, Please, Sir!"	D. J. Sullivan *(London)*
10	Winter Transit	R. Farnish *(Raynes Park)*
11	"Rest and Recuperation", 54 mm.	J. J. Todd *(Basildon)*
12	"Death to the French", 54 mm.	J. J. Todd *(Basildon)*
13	"Schpitfeuer, Schpitfeur", 1/35	A. Ormerod *(Bridgwater)*
14	Who will pay for Malmedy?	R. Scott *(Feltham)*
15	Ambush Incident (Europe 1944), 1/35	I. G. Craig *(Salisbury)*
16	Sinai — the six day war — 1967, 1/32	I. G. Craig *(Salisbury)*
17	Ambushed, 1/35	A. Disdale *(Wembley)*
18	Dawn Capture, 1/35	A. Disdale *(Wembley)*
19	The Last Drop, 54 mm.	R. Dixon *(Coggeshall)*
20	"Checking the Route 1945", 1/35	R. C. Webb *(Marlborough)*
21	"Confrontation 1815"	R. C. Webb *(Marlborough)*
22	"Resistance — France 1943"	R. C. Webb *(Marlborough)*
23	"After the Chase", 54 mm.	J. S. Wheeler-Hopkinson *(Bournemouth)*
24	"Travelling Saleslady", 54 mm.	J. S. Wheeler-Hopkinson *(Bournemouth)*
25	"Tally Ho", 54 mm.	J. S. Wheeler-Hopkinson *(Bournemouth)*
26	Diorama, 54 mm.	K. S. Johnson *(Burnham-on-Crouch)*
27	Resistance, France 1943, 1/35	K. Lyles *(Stanmore)*
28	"Aprés La Bataille", 54 mm.	K. Lyles *(Stanmore)*
29	The Call to Arms, 54 mm.	F. G. Whetnall *(Staines)*
30	It's A Long Way . . . , 1/35	D. Titterton and R. Moore *(Welwyn)*
31	"What War?", 1/35	M. Philpot *(Maidenhead)*
32	"Road in Korea", 1/72	N. Lyon *(W. Wimbledon)*
33	Panzer IV, 1/35	M. Ellen *(Bishop's Stortford)*
34	Wehrmacht Machine Gun Team + NCO, 1/35	A. Saunders *(Pinner)*
35	See Germany and Die, 1/35	A. Saunders *(Pinner)*
36	Carabinieri Pontifici c. 1816, 54 mm	D. M. L. Jones *(Palmers Green)*
37	"Strafed"	P. Dunsmore *(Croydon)*
38	"Theirs not to reason why"	Sue Carfrae *(Wembley)*
39	"Front Line" 1812, 54 mm	Sue Carfrae *(Wembley)*
40	Encounter in the Woods	M. Fewtrell *(Horley)*
41	Horch Personnel Carrier, 1/35	R. Leyers *(Brasschaat, Belgium)*
42	Opel Blitz, 1/35	R. Leyers *(Brasschaat, Belgium)*
43	Sturmpanzer IV Brummbar, 1/35	R. Leyers *(Brasschaat, Belgium)*
44	Landrover Pink Panther, 1/35	R. Leyers *(Brasschaat, Belgium)*
45	German Swimmwagen, Sdkfz 222 and figures, 1/35	J. S. Reynolds *(Bristol)*
46	Battle of Waterloo	Caroline Bee *(Cheltenham)*
47	3rd June 1945, England, 1/32	M. J. Bee *(Cheltenham)*
48	"Wrong Route", 1/35	B. Martyn *(Cheltenham)*
49	"May God protect you, my love", 54 mm.	C. Monks *(Chesterfield)*
50	"Over the top", 1/32	F. P. Lagier *(Salisbury)*

51	Group of soldiers during the Jacobite Rebellion, 1/32	F. P. Lagier	*(Salisbury)*
52	37 mm. Anti-tank Gun, 1/35	N. Browning	*(Salisbury)*
53	Sherman M4A3E8, 1/35	J. K. J. Newell	*(Salisbury)*
54	Battle of Sollum 1941, 1/35	K. Ward	*(Salisbury)*
55	M4 Stuart Tank and Jeep, 1/35	N. Browning	*(Salisbury)*
56	"On the Drive", 1/35	P. Hardisty	*(Salisbury)*
57	"Weasel" Amphibious Craft, 1/48	R. Burt	*(Salisbury)*
58	Brumm Bar, 1/35	S. Jones	*(Salisbury)*
59	Ford GPA Jeep Amphibian with 2 figures, 1/35	R. Burt	*(Salisbury)*
60	The Flying Circus, 1/32	K. Beckhurst	*(London)*
61	Grosses Hauptquartier/ Leibstandarte SS, 1/35	K. Beckhurst	*(London)*
62	The Alma 1854, 54 mm	L. Cutner	*(London)*
63	S.A.S. Jeep, 1/35	K. R. Ransom	*(Leatherhead)*
64	"Give us another egg here Sarge" 1/32	P. J. Smith	*(Southampton)*
65	Kongens Lusager Corps 1807, 54 mm	P. M. Cox	*(Ilford)*
66	Jousting 1812 style, 54 mm.	P. M. Cox	*(Ilford)*
67	St CYR Cadets on parade 1912, 54 mm	R. Coleman	*(Boulogne, France)*
68	First Encounter, 1/35	M. Summerfield	*(Bexley)*
69	Returning to Duty, 54 mm	J. Hullis	*(Ipswich)*
70	Mounted figures, 54 mm.	S. Naegel	*(London)*
71	Officers of Chasseurs a Cheval, 54 mm.	I. S. Mackenzie	*(Sutton)*
72	The 14th of the Line At Elyau, 54 mm.	I. S. Mackenzie	*(Sutton)*
73	Saracen Raiders, 52 mm.	D. M. Catley	*(Reigate)*
74	Necktie Party, 52 mm	D. M. Catley	*(Reigate)*
75	The First of the Race, 52 mm.	D. M. Catley	*(Reigate)*
76	"Battle for the Beachhead", 1/35	R. Hurse	*(Northolt)*
77	British Army Snatch Squad, 1/35	R. Evershed	*(Portsmouth)*
78	Russia 1941 "A well earned break" 1/35	R. W. Dean	*(Southampton)*
79	95th Rifles, 54 mm	A. Gibbs	*(Sidcup)*
80	Capturing of a 6 lb A/T Gun in Africa, 1/35	R. Phelan	*(Woking)*
81	Sir Gawain, 1/32	R. Phelan	*(Woking)*
82	Landsknecht Gunners	S. Ellis	*(Henley-on-Thames)*
83	Under Queensberry Rules, 1/32	S. Ellis	*(Henley-on-Thames)*
84	"Farewell Good Friends", 54 mm.	K. G. Fisher	*(London)*
85	Spanish Landsknecht, 30 mm.	P. Shirley	*(Wickford)*
86	Sturmgeschutz III Ausf G, 1/35	D. Coe	*(Hornchurch)*
87	"Temper, Temper!", 1/35	M. W. Wilson	*(Aylesbury)*
88	"Long Walk Home", 1/32	K. Harding	*(Aylesbury)*
89	"Bumpy Landing", 1/76	P. D. McDermott	*(Aylesbury)*
90	"Carefully does it", 54 mm.	P. D. McDermott	*(Aylesbury)*
91	Epsom & District Pipe Band, 54 mm.	D. C. Boyne	*(Epsom)*
92	Panzertruppen, December 1942, 1/35	M. J. B. Shircliff	*(Bicester)*
93	Ambush, 1/35	J. J. Stalley	*(Purley)*
94	Street Warfare, 1/35	M. Pandeli	*(London)*
95	Roman Ballista, 1/32	N. M. Orr	*(Chester)*
96	Pause in the Action, 2 lb. 3 oz.	M. Hewitt	*(Henley-on-Thames)*
97	Jagdpanther & Infantry, 1/35	D. Warren and C. Fielder	*(Salisbury)*
98	Motor cycle and Crew	D. Warren	*(Salisbury)*
99	Hold Fast, Excise Officers, 54 mm.	A. Garvey	*(Roehampton)*
100	"Rabbit for Dinner", 54 mm.	S. Attwood	*(London)*
101	"Follow the Sun", 1/35	B. S. Parker	*(Edinburgh)*
102	"Winter Camouflage", 1/35	B. S. Parker	*(Edinburgh)*
103	"Death of a Hurricane", 1/32	B. S. Parker	*(Edinburgh)*
104	Life Guards 1815, 1/30	P. Giles	*(Wolverhampton)*
105	British positions at Medenine 1943, 1/35	F. R. Wigley	*(Windsor)*
106	"Mud Glorious Mud", 1/35	J. Barber	*(Allestree)*
107	Roadside Repairs, 1/35	G. P. Wilkinson	*(Ferndown)*

low-melt solder applications to the powerful T4 unit. Many models will be available for demonstration under working conditions and all work with equal efficiency on natural, propane and butane gases. Rhodes Flamefast Limited, Pendlebury Industrial Estate, Bridge Street, Swinton, Manchester M27 1FJ. Telephone 061-793 9333. Telex Flamefast 666387.

Stands 41/42

S. H. Grainger (Caldmore Models) Ltd. are to the fore in what is probably the most rapidly expanding leisure industry. In addition to the retail shop, which is nationally known, they have a thriving worldwide mail order service which has resulted in giving the company an international reputation for service, and a boost to the nation's export figures. The company also has a manufacturing division which specialises in precision glass fibre mouldings, and is the largest manufacturer in the U.K. of fibreglass boats, with distributors and agents throughout the world. In addition the company also produce prototype models for industrial use.

Stand 43

Now in its 53rd year, the Model Power Boat Association is still growing. About 150 open regattas are held by member clubs during a season, and international competitions are playing an increasing part. Please don't be shy of asking our stewards for advice or information — we're glad to help, and can put you in touch with the nearest of our 140-plus clubs.

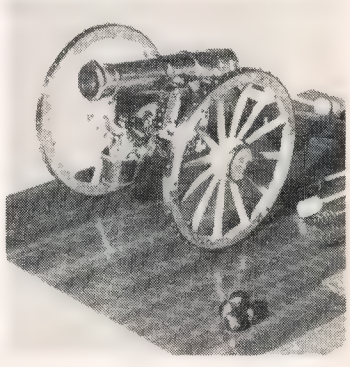
Stand 44

Studiolith Ltd.

Stand 45

A regular feature of the Model Engineer Exhibition is the ever-popular Traction Engine Enterprises Stand. Once again the company will have a large selection of Records and Books on Railways, Traction Engines, Fairground and Street Organs. Also represented on the stand will be Traction Engine Enterprises' associate company M.E. SPECIALIST PUBLICATION SUPPLIES, the leading supplier of bound, unbound and loose issues of *Model Engineer* and *English Mechanics* and a large range of Model Engineering books. Rare Model Engineering books now out of print will also be on sale. A very large range of *Model Engineer* Indexes will be available to enable the enthusiasts to complete their collection of volumes. Of special interest to visitors will be the growing range of specialist books published by the company, all of which will be on sale on the stand

Cannon make attractive modelling subjects and are usually acceptable by the lady of the house as display items. This 32 pdr. SB howitzer, with equipment, is entry number MD8 by C. R. Kirk.



Stands 46/47/48/49/50

Once again Europe's leading model shops, Beatties of London Limited, are exhibiting a large selection from their ranges of model railways, including Hornby, Palitoy, Airfix, Fleischmann, Wrenn, Roco, L.G.B., and of course "Z" Gauge by Märklin. For show and for sale you will find a good selection of Railway Accessories, also a selection of plastic kits by Tamiya, A.M.T., Eschi, etc. Beatties offer many items at special Exhibition Prices, so do not miss the Beattie Stand. Beatties have recently opened their ninth Branch at 38 Pinstone Street, Sheffield 1. The other Branches are at: 112 High Holborn, London, W.C.1, 10 The Broadway, Southgate, London, N.14, 363 Lewisham High Street, London, S.E.13, 14 Spring Gardens, Manchester 2, 18 King Charles Street, Leeds 1, 26 South Mall, Birmingham Shopping Centre, 3 Mount Street, Nottingham 1, and 36/37 Dawson Way, St. John's Centre, Liverpool.

Stand 51

Model & Allied Publications Ltd.

Stands 52 & 53

The "COWELLS 90" Lathe is manufactured to fine tolerances by Cowell Engineering Ltd., and is of compact design, made portable by mounting on a baseplate. The "90" will handle all types of machine parts from large size cast iron wheels and discs, to small intricate parts in steel, brass, alloy and plastic, cut teeth in gears, mill slots, keyways, squares and hexagonal shapes, flycut and bore oversize jobs by mounting on the tee slotted cross-slide and will screwcut internal and external threads. The rugged design and high finish puts the "COWELLS 90" into a class of its own. We also manufacture a model engineers' milling machine and Jigmaster saw, constructed on sound principles using castings for all major components. Our range of Machine Tools are machined to close tolerance and hand fitted to give accuracy in working. Gib strips are provided to allow adjustment for wear in all moving slides. Interchangeable limits are used on all parts.

Stand 54

Cler Site is an old friend of modellers, demonstrated at the last three Model Engineer Exhibitions with total sales more than trebled on each occasion. Cler Site, when applied according to directions, will give as much as seven days of "non-Misting up" of Spectacles, Goggles, Visors, Magnifying Glasses, Medical Probes and Instruments, Photographic Lenses (even T coated), and Enlargers. Our present list of satisfied users includes Royal Aircraft Est., Farnborough, the British Aircraft Corporation, the B.B.C., Hospitals, Fire Officers, Industrial Safety users, Motor and Motor Cycle Racing and Rallying, Skiers, Golfers, Cricketers, and all sportsmen and women, and colour processing companies (C.P.L. Ltd., Edenbridge and Gratispool Ltd., Glasgow). Send your cheque with an extra 10p for postage and packing for ½ oz. Tubes each 85p. 1 oz. Jars each £1, 2 oz. Jars each £1.50, 3 oz. Jars £2 each.

Stand 55

The Kilns Division of Hydebourne Limited specialise in the manufacture of furnaces and kilns for various industrial applications. The range includes furnaces operated by gas, oil and electricity. The temperature ranges vary between stove enamelling kilns of 150°C and melting furnaces of 1,350°C. Standard sizes for metal treatment and melting with maximum temperatures of 1,200°C and chambers up to 1 cubic foot are usually kept in stock. The smallest size standardly available is approximately 3 in. diameter by 5 in. deep. Various temperature control devices are available ex-stock.

108	"Okay Pilot! Consider yourself shot down", 1/35	G. P. Wilkinson *(Ferndown)*
109	Sentence Pronounced, 54 mm.	G. P. Wilkinson *(Ferndown)*
110	Captured, Tried and Condemned, 54 mm.	G. P. Wilkinson *(Ferndown)*
111	Rock Island Line Group, 54 mm.	D. Hamilton *(Kingston-on-Thames)*
112	German 88 mm. Gun, 1/35	N. Franklin *(W. Sussex)*
113	"Go on, pull the other one", 54 mm.	J. A. F. Roberts *(Enfield)*
114	A stop in the desert, 1/32	R. Leyers *(Brasschaat, Belgium)*
115	PZKW I at rest in France, 1/35	R. Leyers *(Brasschaat, Belgium)*
116	Land Rover Ambulance, 1/35	R. Leyers *(Brasschaat, Belgium)*
117	M.P. Field Post, 1/35	R. Leyers *(Brasschaat, Belgium)*
118	M.16 Half Track, 1/35	R. Leyers *(Brasschaat, Belgium)*
119	"On the road to Berlin", 1/35	A. Miller *(Woodford Green)*
120	"Tank Killer", 1/35	A. Miller *(Woodford Green)*
121	Forward Command Post, 1/76	D. Hale *(Ilford)*
122	Pelham's Battery, 1/32	D. J. Hunter *(Llanybyther)*
123	"From The Ridge to Delhi", 1/32	R. G. Lewis *(Swansea)*
124	The Sultress, 54 mm.	S. Kemp *(Morden)*
125	"Battle of Insandlewana 1879", 54 mm.	M. Harris *(Ilford)*
126	1915 W.D. Supply cart, 1/35	Julian Moffat *(Langham)*
127	Taking up Position, 1/35	J. Moffat *(Langham)*
128	Zündapp, Sidecar and Rider, 1/9	J. Moffat *(Langham)*
129	Panzer Kampfwagen II Ausf F/G, 1/35	J. Moffat *(Langham)*
130	Ambush in Auvergne, 1/35	J. Moffat *(Langham)*
131	Triumph 3HW and Rider, 1/9	J. Moffat *(Langham)*
132	Sturmpanzer IV Brummbär, 1/35	J. Moffat *(Langham)*
133	Tamiya Panther V, 1/35	J. Moffat *(Langham)*
134	Trooper, 2nd North British Dragoons 1815, 54 mm.	S. D. Raine *(Maidenhead)*
135	Harrier GR3 on exercise, 1/72	M. Stockdale *(Colchester)*
136	American Marines, 1/72	I. Stockdale *(Colchester)*
137	Lancer Eladslgaate, 54 mm.	A. T. Kettle *(Eastwood)*
138	R.A.M.C. Picking up walking wounded on the Somme July 16, 1/35	E. Rose *(Aylesbury)*
139	U.S. Military Police Team in action, 1/35	A. R. Phillips *(Reading)*
140	Military Modelling	G. Wilson *(Hastings)*
141	"Park Bench Recollections"	G. Wilson *(Hastings)*
142	"The Briefing", 54 mm.	D. W. Probert *(Maidenhead)*
143	"What's Up, D.A.K.?", 54 mm.	D. W. Probert *(Maidenhead)*
144	U.S. Cavalryman & Crow Indian, 54 mm.	S. Harry *(Harrow)*
145	Grenadier Charlie 1776, 54 mm.	H. McLeod *(Cobham)*
146	The Wounded Return, 54 mm.	A. McLeod *(Cobham)*
147	The Surrender, 1/35	M. Hewitt *(Henley-on-Thames)*
148	"Desert Ambush", 1/32	Y. G. Maidment *(Wembley Park)*
149	Crossing the Delaware, 1/32	M. Allen *(Wareham)*
150	The Trophy, 54 mm.	M. Allen *(Wareham)*
151	Panzer Grenadiers 1940, 1/35	S. Dodds *(Camberley)*
152	"Indians big enough for all of us", 1/76	M. W. Mayes *(London)*
153	Surprise/Amiens August 1944, 1/32	P. Rea *(Co. Down)*
154	Forward of the Lines, 1/32	C. French *(Teignmouth)*
155	Pa-Lee-Chiao 1860, 1/32	N. Boothroyd *(Newcastle)*
156	German Observation and Refuelling Post, 1/72	M. Whitcombe *(Kingswood)*
157	Diorama, 54 mm.	Z. M. Behnke *(Palmers Green)*
158	"Defence of the Loot", 54 mm.	P. Beckwith *(Billericay)*
159	Blue for You, 54 mm.	C. Davis *(Croydon)*
160	The Casualties, 54 mm.	N. R. Holmes *(London)*

161	Panzer N/70 with crew, U.S. Jeep, 1/35	R. Farnish *(Raynes Park)*
162	"Come and see how a Marshal of France dies", 54 mm.	A. MacDonald *(Berkhamsted)*
163	Quad Limber and 25 pounder, 1/35	M. Wilkinson *(London)*
164	Crusader tank and half track, 1/32	M. Wilkinson and N. Grecas *(London)*
165	SAS Jeep and Zundapp motorbike, 1/35	M. Wilkinson and N. Grecas *(London)*
166	Charge of the Bengal Lancers, 1/35	S. C. Brown *(March)*
167	"Continuing Resistance" 1945, 54 mm.	A. Nicholas *(Waterlooville)*
168	Mortar Action, 1/35	F. Verlinden *(Belgium)*
169	Battle for the Reich, 1/35	F. Verlinden *(Belgium)*
170	Artillery Position, 1/35	F. Verlinden *(Belgium)*
171	Street Fighting, 1/35	F. Verlinden *(Belgium)*
172	Flak Panzer Wirbelwind, 1/35	F. Verlinden *(Belgium)*
173	Desert Scene 1947, 1/35	F. Verlinden *(Belgium)*
174	Imperial Guard Cavalry, 54 mm.	E. A. Pollard *(Nottingham)*
175	Gandamack, 1/32	P. R. Woodman *(Rochdale)*
176	"The Golden Dragon Died", 25 mm.	J. L. Railton *(Tring)*
177	The Flying Gunners	W. Elliott *(Kingsbury)*
178	Death of a Friend, 54 mm.	P. B. Cottrell *(Horsham)*
179	General of Spanish Cav. with Lancers & Guerillas, 54 mm.	A. Cutner *(London)*
180	"The Toll Keeper", 1/76	P. J. Hoban *(Hemel Hempstead)*

CLASS MB: Unconverted Single Figures

No.	*Description*	*Name and Town*
1	Samurai Warrior, 90 mm.	A. S. Proctor *(Barnet)*
2	Mounted French Dragoon, 1809 90 mm.	A. S. Proctor *(Barnet)*
3	Cannon Fodder — French Grenadier of the Guard, 54 mm.	D. J. Sullivan *(London)*
4	Hussar de la Mort — 1793, 54 mm.	J. J. Todd *(Basildon)*
5	Grenadier Hollandais, 54 mm.	J. J. Todd *(Basildon)*
6	Poniatowski's Guide, 54 mm.	T. Neate *(Melksham)*
7	95th Rifleman Peninsula	S. A. Asquith *(South Harrow)*
8	Japanese Infantryman, 1944, 1/32	R. C. Webb *(Marlborough)*
9	Duke of Wellington, 54 mm.	G. J. Carter *(Maidstone)*
10	Mameluke Officer, 1813, 90 mm.	G. J. Carter *(Maidstone)*
11	Marshal Murat of France, 54 mm.	D. G. Kempster *(Nottingham)*
12	Sassanid Clibanarius 7th Century, 54 mm.	D. G. Kempster *(Nottingham)*
13	Persian Armoured Camel & mounted archer, 54 mm.	D. G. Kempster *(Nottingham)*
14	Field Officer, 32nd Foot, c. 1815, 77 mm.	F. G. Whetnall *(Staines)*
15	Captain, the Black Legion, c. 1520, 77 mm.	F. G. Whetnall *(Staines)*
16	"Von Frehlich", Grenadier Zimmermann, c. 1808, 54 mm.	D. M. L. Jones *(London)*
17	77 mm. figure	S. Naegel *(London)*
18	Carabinier Kettledrummer, 54 mm.	M. G. Loring *(London)*
19	Trooper, 2nd Polish Lancers, 77 mm.	D. P. Scott *(Wellingborough)*
20	Black Prince, 54 mm.	M. Bowis *(Purley)*
21	Viking in Ceremonial Dress, 1/10	P. Shirley *(Wickford)*
22	French Drummer, 1815, 75 mm.	S. R. Box *(Haywards Heath)*
23	Chasseurs a Cheval de la Garde, 1815, 54 mm.	S. R. Box *(Haywards Heath)*
24	Spanish Drummer, 75 mm.	S. Kemp *(Morden)*
25	Landwher, 77 mm.	S. Kemp *(Morden)*
26	Cuirassier 1812, 54 mm.	K. Brown *(Horsham)*
27	Empress Dragoon Trumpeter, 54 mm.	K. Brown *(Horsham)*
28	Dutch Lancer, 1815, 1/30	P. Giles *(Wolverhampton)*
29	Trumpeter, 3rd regiment Lancer-Scouts, 54 mm.	J. Richards *(Cinderford)*

Stand 56

Puffers, of 134A Kenton Road, Kenton, Harrow, Middlesex (Tel. 01-907 3521/8271), London's premier railway centre, caters for all model engineers. Whatever your interest or speciality, try Puffers for friendly and enthusiastic service. We have a wide range of kits with an emphasis on railways and also stock all the most popular ready-to-run items. We have a vast stock and can probably help you with whatever you require, be it O, OO, HO, N, British or Continental, new or secondhand. So make Puffers your next stop after the exhibition — we are just down the road opposite Kenton Station. We look forward to meeting you!

Stands 57/58

Once again CHARLES KENNION will be waiting to meet you on Stands 57 and 58 with all the variations of supplies that are required to build any kind of Model, with emphasis of Locomotives. The range of castings and materials has been increased yearly and is still improving; Loctite and Railway colour paints are the latest with the etched and coloured nameplates that delight the eye. A 5 in. g Tich is being prepared and drawings will shortly be available. If you cannot get to the Exhibition, why not call at the Works and Stores at 2 Railway Place, Hertford.

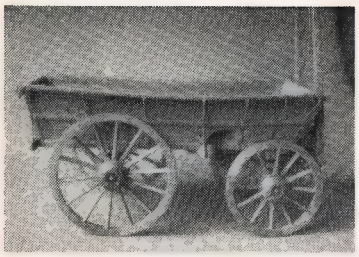
Stand 59

Gloy have been making and selling adhesives for many years, starting in the late 1890s, and over the years have added many additional products to the range. These are sold in many of the stationery and decorating outlets. The company have now established a range of products suitable for most model enthusiasts, and new products will be continually made available to meet the most stringent demands of the modeller. The first of these new products will be a liquid polystyrene cement in a 30 ml. glass jar, and Gloy Cyano, a cyanoacrylate adhesive in a 2 and 10 gm. pack.

Stands 60/61

Kenneth Johns Ltd. Visitors to our Stand last year will know that we like to put on a show for them. Whatever we did then must have been right, judging by the crowds around our Stand, so we have decided to do the same (but better!) in January, 1977. Mr. A. C. Perryman, Chairman of the Worthing and District Society of Model Engineers was especially popular, so instead of one visit he will be our guest on two days. But that's not all, here's our guest list: Jan. 5, 6, 7, 10, 11, 12, 13, 14, 15, Mr. Ilett, Technical

Radio control has removed virtually all restrictions from the choice of prototype for a scale flying model. This 1/10 model of a 1910 Dunne D8 tail-less pusher is 55 in. span and was built by R. J. Parkhouse; exhibit number is AB2.



Fastest-growing aspect of "non-working" modelling is horse-drawn vehicles. This example, exhibit number R1, is an East Anglian Wagon by G. B. Eurich, all dimensions and details of which were taken from an original wagon.

Demonstrator for the U.K. Concessionaires. Demonstrating and advising on Sievert L.P. Gas Equipment, brazing techniques, etc. Jan. 5, 6, 12, 13, a Representative from Johnson Matthey to advise on brazing materials. Jan. 7, 14, Mr. Perryman, to give visitors the benefit of his experience and to advise on model engineering. Jan 8, Mr. Harvey, Past Chairman of British Society of Scientific Glassblowers. Working with glass, making glass figures, etc. Our own staff will be more or less the same as last year, Bill Storer, Ken Dark, George Witney and John Loveless, all ready and willing to help you if we can. To top it all, we'll find some good bargains for you, and will be selling, from the Stand, Sievert Equipment, Johnson Matthey brazing rod and flux, as well as an assortment of hand tools from hacksaws to oil sprays.

Stands 62/65/66/67

The Society of Model and Experimental Engineers caters for all branches of model engineering, and this Society, which was founded in 1898, offers its members the use of a fully-equipped workshop, a well-stocked library and a main meeting room. Lectures by acknowledged experts are held regularly. Beginners are given the opportunity of meeting experienced craftsmen, through whom they can learn the ways and means by which models and tools can be made and operated. Competitions for silver and bronze medals and other awards are held twice a year, and the social side of the Society culminates in an annual dinner to which members may invite their ladies and guests. Monthly News Sheets and an Annual Journal are sent free to members. Overseas and country members are welcome and for these subscription rates are adjusted according to distance. Application for membership should be made to: The Secretary, Arthur A. Smith, Marshall House, 28 Wanless Road, London, S.E.24. 'Phone: 01-674 5317.

Stands 63/64

Chilterns Model Railway Association.

Stand 68

Lapidary Abrasives Ltd.

Stand 69

Albion Scott Ltd.

Stand 70

Quercus Gemcraft.

30	Greek Archer, 77 mm.	A. T. Kettle	*(Eastwood)*
31	Sergeant 95th (Rifle) Regiment, 1808/9, 77 mm.	R. J. Nellist	*(Birmingham)*
32	Tambour 27th Regiment, 75 mm.	R. J. Nellist	*(Birmingham)*
33	Old Guard in Greatcoat, 75 mm.	C. D. Cunnington	*(Birmingham)*
34	Capitaine, French 20th Dragoons, 1809, 75 mm.	C. D. Cunnington	*(Birmingham)*
35	Porte — Drapeau of the Imperial Guard, 1814, 54 mm.	Y. G. Maidment	*(Wembley Park)*
36	Samurai Warrior	J. A. Heath	*(Slough)*
37	Officer Chasseur A Cheval, 54 mm.	M. Allen	*(Wool, nr Wareham)*
38	Spanish Inf. 1811, 54 mm.	T. Eden	*(Hillingdon)*
39	Spanish Inf. 1811, 54 mm.	T. Eden	*(Hillingdon)*
40	Royal Marines Drummer, 120 mm.	N. J. Yeadon	*(Thurton, Norwich)*
41	Afrika Corps Figure, 1/32	M. Wilkinson	*(London)*
42	Eighth Army M.P., 1/32	M. Wilkinson	*(London)*
43	Trooper 6th (Inniskilling) Dragoons, 1/32	D. G. Prior	*(Swindon)*
44	Private 95th Rifles, 1808, 75 mm.	A. Nicholas	*(Waterlooville)*
45	Officer, Inniskilling Dragoons, 1815, 54 mm.	A. Nicholas	*(Waterlooville)*
46	Landsknecht, 54 mm.	P. R. Woodman	*(Rochdale)*

CLASS MC: Scratchbuilt or Converted Single Figures

No.	*Description*	*Name and Town*	
1	Viking A.D. 1100, 54 mm.	R. V. Hailes	*(Stanmore)*
2	British Dragoon 1746, 54 mm.	R. V. Hailes	*(Stanmore)*
3	British Commando, 1/9	R. Scott	*(Feltham)*
4	Viking Chieftain, 1/9	R. Scott	*(Feltham)*
5	After the Battle, 54 mm.	R. C. Webb	*(Marlborough)*
6	Wounded Officer 1st Royal Dragoons, c. 1742, 54 mm.	R. C. Webb	*(Marlborough)*
7	Confederate Infantryman, 1864, 54 mm.	S. Hobbs	*(Horndean)*
8	Persian Musketeer, 1610, 54 mm.	S. Hobbs	*(Horndean)*
9	Imperial Herald, c. 1520, 70 mm.	F. G. Whetnall	*(Staines)*
10	Der Pannertrager von Nurnberg, 54 mm.	F. G. Whetnall	*(Staines)*
11	Count Brass, 1/32	R. Coles	*(West Lothian)*
12	Elric, 1/32	R. Coles	*(West Lothian)*
13	British Infantry side drummer	G. M. Waugh	*(Sunderland)*
14	French Infantryman	G. M. Waugh	*(Sunderland)*
15	French Dragoon, 1815, 54 mm.	I. S. Mackenzie	*(Sutton)*
16	Chief Ironshirt, 52 mm.	D. M. Catley	*(Reigate)*
17	U.S. Technical Sergeant, Falaise, 1944, 1/35	R. Hume	*(Northolt)*
18	Lieut. Middx. Regt. Korea 1950, 54 mm.	P. Cain	*(Ruislip)*
19	Queens Rangers, 1780, 54 mm.	N. Chandler	*(London)*
20	NCO 2nd Hanoverian Dragoon Regt., 1871, 54 mm.	N. Chandler	*(London)*
21	Riot Squad Trooper, Oceania, 1984, 1/32	P. Shirley	*(Wickford)*
22	"Rollerball 2018", 1/12	P. King	*(London)*
23	Trooper Carabiniers, 1804-1815, "Resting", 54 mm.	A. R. Phillips	*(Reading)*
24	Signifer 3rd Praetorian Cohort, 54 mm.	A. Garvey	*(London)*
25	British Officer of 1st Madras Light Cavalry, 54 mm.	S. Attwood	*(London)*
26	Polish Light Horse, 17th, 54 mm.	M. Rust	*(Lutterworth)*
27	Honour Guard, 54 mm.	S. Kemp	*(Morden)*
28	"Stand Still, Damn You!", 1/32	D. J. Hunter	*(Llanybyther)*
29	Confederate Infantryman, 1/12	D. J. Hunter	*(Llanybyther)*
30	Officer 8th Hussars, 1/12	D. J. Hunter	*(Llanybyther)*
31	1st Royal Dragoon, 1815, 1/30	P. Giles	*(Wolverhampton)*
32	Figure, 1/9	J. Pope	*(London)*
33	Boer Amazon, 54 mm.	A. T. Kettle	*(Eastwood)*
34	General George Meade, 54 mm.	A. T. Kettle	*(Eastwood)*

35	"Johnny Reb Resting"	G. Wilson	*(Hastings)*
36	Private, 3rd Reg. Grenadiers a Pied, (Ex. Hollandais), full dress, 1812, 54 mm.	D. W. Probert	*(Maidenhead)*
37	Tamerlane Turkish Warrior, 56 mm.	C. D. Pettitt	*(Harrow)*
38	3rd Rgt. Lancer Scouts, 54 mm.	E. A. Pollard	*(Mapperley)*
39	Lancers of Berg Trumpeter, 54 mm.	E. A. Pollard	*(Mapperley)*
40	Dutch Grenadiers, Musician, 54 mm.	E. A. Pollard	*(Mapperley)*
41	92nd Foot, 1858, 54 mm.	P. R. Woodman	*(Rochdale)*

CLASS MD: Single Military Vehicles or Artillery Pieces

No.	*Description*	*Name and Town*	
1	U.S.A.F. Personnel Carrier, 1/8	P. E. Hingston	*(Grove, nr. Wantage)*
2	Tank Panzer Kampfwagen III Aus F, 1/8	P. E. Hingston	*(Grove, nr. Wantage)*
3	Italian Gun on lorry, 1/38	C. J. C. Miners	*(Cheltenham)*
4	Israeli Army Centurion Mk. III, 1/25	K. J. Taylor	*(Stanmore)*
5	German Panzers I to VI, 1/35	K. B. Barrett	*(Barkingside)*
6	Home Defence Armoured Train, 1940, 2 mm.	G. Balfour	*(East Grinstead)*
7	Zündap KS750, 1/9	D. P. Newton	*(Romford)*
8	32 Pr. SB Howitzer, 1862, 1/16	C. R. Kirk	*(Burgess Hill)*
9	Bath & Laundry Unit, Ruhr, 1945, 1/35	A. J. Dennis	*(Pinner)*
10	SAS Land Rover, 1/35	D. Warren	*(Salisbury)*
11	Israeli M3 Half-track, 1/35	M. Barnes	*(London)*
12	Crusader III, 1/32	P. Charles	*(Chipping Norton)*
13	Gun, Operational Bedford QL, 1/35	F. R. Wigley	*(Windsor)*
14	BMW R75 Motorcycle and sidecar, 1/9	G. Leech	*(Kingston-on-Thames)*
15	Triumph 3HW Solo motorcycle, 1/9	G. Leech	*(Kingston-on-Thames)*
16	Diamond T M20 980, 1/35	P. Webster	*(Sutton Coldfield)*
17	Centurion A.R.V., 1/48	L. R. Ingram	*(Birmingham)*
18	Chieftain A.V.L.B., 1/48	L. R. Ingram	*(Birmingham)*
19	Sherman Crab, 1/48	L. R. Ingram	*(Birmingham)*
20	Pzkpfw V Panther Ausf, 1/35	S. Farnish	*(London)*
21	Humber Armoured Car, 1/76	P. Hazell	*(Ashford)*
22	Semovente M40-75/18, 1/35	P. Hazell	*(Ashford)*
23	1914-18 "Old Bill" Bus, 4 mm.	R. C. Lightheart	*(Welling)*
24	Opel Blitz Omnibus Command Post 1/72	R. C. Lightheart	*(Welling)*
25	German Tank Destroyer SD.KFZ 131, 1/35	G. Sheppard	*(Orpington)*
26	Panzer Kampfwagen II, Ausf F, 1/35	G. Sheppard	*(Orpington)*
27	9 pdr. brass cannon, c. 1800	R. Pither	*(Camberley)*
28	24 pdr. brass cannon, 1732	R. Pither	*(Camberley)*
29	Panzerkampfwagen III, Ausf L, 1/76	P. J. Hoban	*(Hemel Hempstead)*

CLASS MJ1: Single figures (juniors)

No.	*Description*	*Name and Town*	
1	Corporal, Inniskillings, 1815, 54 mm.	A. M. Hey	*(Woodford Green)*
2	Trumpeter, 1st Regt. of Dragoons, 1809-10, 90 mm.	G. J. Carter	*(Maidstone)*
3	Trumpeter of the Mamelukes	G. Couves	*(Gravesend)*
4	Grenadier Hollandais, 1/30	M. Smith	*(Pinner)*
5	9th Lancers Officer, 1820, 90 mm.	K. Lyles	*(Stanmore)*
6	Centurion — 130 A.D., 54 mm.	D. B. Honigmann	*(Beaconsfield)*
7	Trooper, 7th Cuirassiers (French), 1811, 54 mm.	R. Brzezinski	*(Greenford)*
8	Bavarian Foot Grenadiers of the Leis Regt., 1809, 1/30	N. C. Scott	*(Northwood)*
9	British Chindit, 1944, 1/32	Melita Dennett	*(Hastings)*
10	D.A.K. Marching with dog at feet, 54 mm.	J. Davies	*(Angmering-on-Sea)*

Stand 71

The Lapidary Shop is a supplier of jewellery findings in base metals, 9 ct. gold, silver, plated and sterling silver, cut and polished stones, rare minerals (especially fluorites), green Cumberland slate clocks, ashtrays, egg timers, and many other items. We also offer a custom cut cabochon service. Most of the above is available through our main order service. If there is anything on the market you cannot get or are unable to obtain we will endeavour to get it for you.

Stand 72

Lapidary Machinery Company.

Stand 73

Kew Bridge Engines Trust.

Stand 74

Younglass.

Stand 75

Crystalform Ltd.

Stand 76

Microflame (UK) Ltd./Expo Drills.

Stand 77

Coronet offer machinery and accessories for the Lapidary, as well as a large range of jewellery fittings, etc. In particular, they carry a variety of better class cast pendant and ring mounts. A selection of rings, pendants and fittings in sterling silver is also available. Model makers will be interested in the variety of chains on offer. Trade enquiries are welcome. Coronet Trading Co., 44 Station Lane, Hornchurch, Essex RM12 6NB. Tel: Hornchurch 58512.

Stand 78

Gem Craft magazine.

Stand 79

Multicraft.

Stand 80

Craft o' Hans (London) are British Agents for Millefiore glass beads, and Horst Uhlig K.G. kilns and accessories. We stock Everything for the Enameller. Copper — the largest range of traditional and novelty shapes; Enamels — over 150 different colours including those we grind ourselves; a comprehensive range of kilns, with and without regulators; enamel transfers in both coloured and gold designs; Millefiore beads in small, medium and large sizes, mixed and individual patterns in opaque and transparent; decoration media — mosaics, beads, frits, lumps and threads. We also run courses in enamelling for beginners and those who wish to improve their knowledge of the craft.

Stand 81

Franklin Crafts.

Stand 82

The Napoleonic Association has been formed by enthusiasts to further interest in the period 1796-1815 through re-enactment, wargaming, social events, historical research and publications. The Association has links in Europe and America with other societies, and believes their success is due to the wide range of interests and activities covered — whatever your

interests are, the chances are you will find what you are looking for in the N.A. For further information, either visit Stand 82 or write to Howard Giles, The Napoleonic Association, 2 Esher Mews, Mitcham, Surrey.

Stands 83/84

Minifigs (Miniature Figurines Limited) are again showing a full selection of their ever-increasing 15 mm. and 25 mm. Wargames figures. Producing a vast range, manufacturing in the best quality jewellery alloy available, backed up with Franchise Retailers Agencies and direct Mail Order facilities, factories in America and Australia, the Company rightly boasts "The best name in Wargaming". The undisputed policy of expansion has not been overlooked during the improvement stage of older ranges. Time marches on, so whilst earlier models were in their day the best figures available, progress and connoisseur wargamers and collectors demanded even better. This the Design Staff have achieved in recent months, thus maintaining and increasing the high standard Minifigs have set themselves. The Design, Production and Sales Departments are aware of customer requirements — quality models, clean castings, prompt despatch, just to name a few — so do not say wargame figures, say Minifigs.

Stands 85/86/87

Plaistow Pictorial have many new poster subjects for sale and there is still no increase in price. Because of steadily expanding sales, we have not increased our prices for eight years — surely a record. Pictorial Prints must be the best value for money at the show. Pictorial Factsheets are proving extremely popular with the addition of the Lancaster and B-17 Fortress. Also available is our new range of aircraft postcards as well as the latest editions of Gordon Riley's Aircraft Museum Directory and Vintage Aircraft Directory. All back issues of *After the Battle* are still available, also our new guidebook to the battlefields of the First World War, *Before Endeavours Fade*.

Stand 88

Historex Ltd.

Stands 89/101/102

Skytrex Ltd. should have something to interest most customers this year. Besides our own extensive range of 1/300th micro tanks, aircraft, 1/300th ships and wargame rule booklets, we are representing Simulation Publications U.K., Greenwood & Ball Ltd., Avalon Hill Games, Wargame Research Group and Tabletop Games. Many new board games will be available as well as most well-known standard games. All the latest Garrison figures will be on sale especially the superb Hyperborean Age range. Collectors' figures in 54 mm. by Sanderson, Lasset, Benassi and Braithwaite should provide interest for the most discerning customer. Trade enquiries are welcome for many items we stock.

Stand 90

The Model Shop is the manufacturer and sole distributor of Jacklex 20 mm. fine cast white metal figures. The range includes figures for the Sudan campaigns, Zulu wars, and Colonial campaigns in India, as well as the Russian army of 1800 and British and German troops of the First World War. The Model Shop has a very extensive range of plastic kits, wooden boat and aircraft kits, radio control, aircraft and marine engines with all accessories. The railway department has a very large and varied selection of British and Continental railway equipment in all scales as well as a very comprehensive range of secondhand items.

Stand 91

Europex Ltd.

11	54 mm. Figure	G. Tullis *(Sheet, nr. Petersfield)*
12	Native Warrior — Omdurman, 1898, 54 mm.	M. A. Birchall *(St. Helens)*
13	Afrika Korps 42, 1/32	B. Carlton *(Mansfield)*
14	8th Army Private charging with sten gun, 54 mm.	P. J. Smith *(Southampton)*
15	95th Rifleman, 1809, 1/24	S. Ellis *(Henley-on-Thames)*
16	Drum Major, Irish Regt. of Canada, 1958, 54 mm.	N. Chandler *(London)*
17	Terek Cossack (SS) 1943, 54 mm.	J. A. F. Roberts *(Enfield)*
18	"Waiting" — Inniskilling Dragoon, 54 mm.	R. Goldstein *(Gantshill)*
19	"Before the Barrage", 8th Army, El Alamein, 1942, 54 mm.	D. A. Barnard *(Colchester)*
20	Black Watch Highlander, 1815, 54 mm.	G. Scopes *(Tadworth)*
21	2nd Foot Guards (Coldstream), 1815, 54 mm.	S. D. Raine *(Maidenhead)*
22	Lieut., WH, Italian Front, 1943, 54 mm.	D. W. Probert *(Maidenhead)*
23	Private, French Pioneer Corps, 1815, 54 mm.	R. Brandon *(Sutton Coldfield)*
24	Queen Elizabeth I, 1/12	Christine Wright *(Sutton Coldfield)*
25	German Officer, 80 mm	M. Hewitt *(Henley-on-Thames)*
26	French Hussar Trooper	C. French *(Teignmouth)*
27	Waffen SS Mountain Trooper	S. French *(Teignmouth)*
28	Napoleonic Grenadier, 75 mm	S. C. Grimmer *(East Dereham)*
29	Mounted French Napoleonic, 1/32	D. Lee *(Worcester Park)*
30	The Hunter, 54 mm.	M. Nutley *(Biddenham)*
31	"On the Move" — German Wehrmacht NCO, 1/25	A. Whitcombe *(Bristol)*
32	L.T. Western Desert, 1942, 54 mm.	M. Festenstein *(London)*
33	Sapper, 12 Dragoons, 1809, 54 mm.	N. R. Holmes *(London)*
34	Milan, 1524, 1/9	D. P. Hills *(Hitchin)*
35	The 17th, 54 mm.	G. P. Barker *(Stanford-le-Hope)*
36	Normandy '44 — Panzer Grenadier, 1/35	A. R. Darvill *(Uxbridge)*

CLASS MJ2: Single Military Vehicles or Artillery Pieces (Junior)

No.	*Description*	*Name and Town*
1	WW II BMW R/75 and Sidecar, 1/35	R. Farnish *(London)*
2	25 Pounder and figures, 1/35	S. J. Andrews *(London)*
3	Pink Panther at Command Post, 1/35	N. Salmon *(Elm Park)*
4	Leopard Tank, 1/35	P. Wylie *(London)*
5	Panzerkampfwagen IV, 1/35	M. Wylie *(London)*
6	Battle Scene, 1/35	D. Barett *(Barkingside)*
7	Daimler Scout Car, 1/35	R. Goldstein *(Gants Hill)*
8	T34/76 "Berlin 1945", 1/35	J. Davies *(Angmering-on-Sea)*
9	Super Sherman MK51, 1/35	R. Atkinson *(Crawley)*
10	Dodge Truck with 37 mm anti-tank gun, 1/35	D. Leadley *(Wormley)*
11	1/35 King Tiger	G. Tullis *(Sheet, nr. Petersfield)*
12	Aerial Rescue, 1/72	N. Brunning *(Horley)*
13	Schwerer Panzerspahwagen, 1/35	K. J. Mitchell *(Bromley)*
14	½ Ton Land Rover, 1/32	P. Hardisty *(Salisbury)*
15	Katyusha, 1/35	J. K. J. Newell *(Salisbury)*
16	Anti Tank Gun Carriage, 1/35	C. Paintin *(Salisbury)*
17	M3 A1 Cast-hulled Sherman Tank, 1/35	P. J. Smith *(Southampton)*
18	Marder II, 1/35	S. Ellis *(Henley-on-Thames)*
19	Dodge A/T Gun Carriage, 1/35	D. Fairhead *(Meopham)*
20	German Armoured Car SDKFZ 222, 1/35	I. Prentice *(London)*
21	Sturmpanzer IV Brummbar, 1/48	D. A. Barnard *(Colchester)*

22	8th Army 1942, 54 mm.	T. Westcott *(Bristol)*
23	Crusader III, British cruiser tank, 1/32	D. Pritchard-Jones *(Sutton Coldfield)*
24	Sturmgeschutz III, German tank, 1/35	A. Jones *(Sutton Coldfield)*
25	Baling Out, 1/35	C. McLeod and T. Browning *(Cobham)*
26	U.S. HA4 Track M3A2, 1/35	S. Dodds *(Camberley)*
27	Ford G.P.A. Jeep, 1/35	R. Broughton *(Sevenoaks)*
28	Tank — Mark II Matilda	C. French *(Teignmouth)*
29	German Tank, 1/35	S. C. Grimmer *(East Dereham)*
30	The Breakdown, 1/35	C. Shillito *(Corby)*
31	Walker Bulldog	D. Hambrook *(London)*

CLASS: Student Cup

No.	*Description*	*Name and Town*
1	Seven-day Weight-driven Wall Clock	First Year Apprentices of Thomas Mercer Ltd. *(St. Albans)*
2	Half-scale 105 mm. Gun Breech Mechanism	Apprentices of Royal Arsenal *(Woolwich)*
3	Steam Plant	M. Green, Queensmead School *(South Ruislip)*
4	Stuart Turner 5A Engine	P. Stearne, St. Ivo School *(St. Ives, Cambs.)*

CLASS: Loan Exhibits

No.	*Description*	*Name and Town*
1	Drill Grinding Jig to fit Quorn Cutter Grinder	I. Strugnell *(Loughton)*
2	5 in. gauge Firefly	P. Larkin *(Morden)*
3	M.E. Traction Engine, 1 in.	J. Ordish *(Morden)*
4	Experimental Prototype Steam Engine	J. J. Walker *(Tamworth)*
5	Kennedy Bar & Tube Bender	E. P. Hyatt *(South Croydon)*
6	Three Showcases of Military Subjects	J. Wylie *(London)*
7	Two 80 mm. British Soldier Figures	M. Onslow *(Hounslow)*
8	Brighton Terrier, Gauge 1	J. S. Bremner *(Southwick)*
9	G.E.R. 1500 Class B12, Gauge 0	J. S. Bremner *(Southwick)*
10	King James, Gauge 0	J. S. Bremner *(Southwick)*
11	King Henry VIII, Gauge 0	J. S. Bremner *(Southwick)*

Stand 92

At this Exhibition Seagull Models/Realmodel will be concentrating on metal figures of 54 mm. scale and upwards, books and paper models. Special features will be the figure ranges of Norman Newton, Rose Miniatures, Chas. C. Stadden and Realmodels along with many painted examples and dioramas. There will also be some new items of interest to the collector on sale for the first time at this show. As the stand can only reflect a small part of our stock why not pay a visit to the two shops in South Kensington, where you will find full stocks of aircraft, car, motorcycle, truck and armour kits, paper models, boxed wargames, rules, books, tools, in fact, just about everything the modeller could wish for.

Stands 93 & 98

The New Hope Design display again features some of the finest models available for both military miniature collectors and wargamers. Additionally, there is a range of figures for railway enthusiasts in the Branchline series and a selection of modelling aids. For the miniature collector, the well-known Old Guard and Deauville white metal kit ranges are again a prominent feature. A new range makes its debut at the Exhibition, the Men-at-Arms Autographed Collection, a series of figures planned jointly by New Hope Design and Osprey Publications. Every figure is based on artwork contained in the well-known Men-at-Arms book series. For the wargamer, the full range of GHQ Micro-Armour will once more be on show, including the fabulous new modern tanks, and from GHQ also come Micro-Nauts and 25 mm. Guardsmen figures. All New Hope Design products are backed by an absolute guarantee — whether bought at the Exhibition, at your local hobby shop or by mail order.

Stand 94

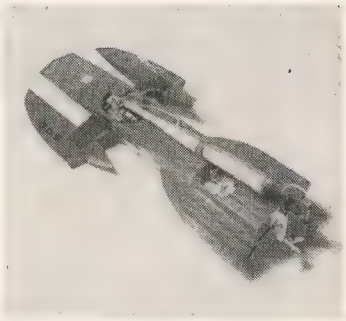
Artillery and Wheelcraft includes the manufacture of 1/12 scale and 1/16 scale artillery and cart wheels, also for sale 6 pdr. artillery pieces with limbers in oak and mahogany. Other lines include various sizes of plinths, gun implements for the 18 pdr. garrison gun, and the well-known "Discovery" books on all military subjects. The owner will be giving practical demonstrations on wheel-making and parts for artillery models.

Stand 95

Military competition exhibits.

Stands 96/97

Hinchliffe Models Ltd., are manufacturers of fine cast, white metal military figures and equipment, produced in sizes ranging from 12 mm. to 120 mm. Our sales cover model shops throughout the U.K. (and direct mail order) plus exporting to all major countries of the world with the exception of the U.S.A. In the U.S.A. Heritage Models Inc. produce and market our products under licence. Company policy is one of continually adding new figures and equipment models to all our ranges, so enabling all collectors of our products to enjoy a continuity of interest. Much of the design emanates from our own workshop, especially that for the military equipment pieces, this being backed by a staff of the world's leading figure designers.



Growing interest is being shown in radio-controlled hydroplanes, until recently popular only in the U.S.A. This model is *Wing Ding*, which powered by an O.P.S. 60 engine (10 cc.) has already exceeded 50 m.p.h. Built by D. J. Collins, exhibit number H4.

Stand 96a

Electronikit Ltd.

Stand 99

Modelcraft.

Stand 100

Society of Model Aeronautical Engineers. If you fly any sort of model aircraft — control-line, radio-controlled or free-flight — the SMAE is the one organisation to protect your interests throughout Britain. Now, more than ever, with fewer sites available for model flying, and tighter limitations on their use, it is only with the help and experience of the national Society that you can be sure of getting the very best facilities for all branches of our sport. For the 90 per cent of SMAE members who never take part in national competitions this reason alone is often sufficient for joining, but the Society has overall responsibility for all aspects of model flying, including organisation of national and international competitions. It laid the foundation of today's whole World Championships programme, and has run 12 out of 67 of these top-class events since 1949, being honoured for its part in international aviation by the Honorary Group Diploma of the Federation Aeronautique Internationale, the "Olympic Committee" of world sporting aviation. If you enjoy your model flying you owe it to yourself and other flyers to join the SMAE now and help your own sport.

Stand 103

The Romford and Dagenham Model Boat Club was founded by Commander Frank Guffick, the Club Commodore, in 1962 while recovering from a heart attack. Since that time over 500 boys and girls have passed through the Club, building some 800 different ships and boat models, including two 18 ft. scale model Lifeboats. The Club is not only helping keep youngsters off the street but also introducing them to a keen hobby and, in some instances, taking boys and girls with potential aside to teach them drawing office work, design work,

carpentry work, regardless of race, colour or creed.

At the time of writing the Parents Committee are trying to sell £1 Shares to build a decent Club Building as the Model Club is run in a small 8 by 6 shed. £1 Shares can be obtained from the Building Fund Secretary, Mr. L. Spector, 7 Gray Avenue, Dagenham, Essex

Stand 104

Wargames demonstrations.

Stand 105

The Waterloo and Peninsula Association is a Napoleonic re-enactment group, and its aim is to aid British charities in raising money, either by supporting their functions or by direct donation. The average age of members is 17 and they travel from as far afield as Hexthorpe in Yorkshire and Wellington in Somerset. Many of the uniforms are made by the members themselves, great care being taken to obtain authenticity. The Royal Horse Artillery is the most newly-formed regiment and consists of two batteries of Rocket Troops, based in Somerset, and London, and a 9-pdr. gun team. The Association puts on displays, re-fighting Napoleonic battles all over England. A considerable amount of the equipment used at these displays is authentic and has considerable antique value. For membership or fund raising details, please contact: Des Lundt-Smith, Public Relations and Membership Officer, Waterloo and Peninsula Association, 67 Bishops Wood, St. John's, Woking, Surrey GU21 3QB. Tel. Woking 66371.

Stand 106

The British Model Soldier Society, the first of its type in the world, has for more than 40 years been representative of those who are interested in military modelling in all its aspects. It has extensive membership at home and overseas, and, with a London headquarters, has branches in many parts of the U.K. and in Canada. A popular feature of the Society's displays at past Model Engineer Exhibitions has been the display and demonstration of various skills and techniques relevant to the hobby, such as soldering, animation, conversion, painting, etc., and it is intended to include this type of active demonstration at the 1977 Exhibition. In addition as comprehensive a cross section of the modelling and other activities of the Society as possible will be displayed, bearing in mind its many facets and contributory interests, military history, the study of uniforms, prints, AFVs and the like. A cordial welcome is extended to all visitors to the M.E.E., who are invited to call at the B.M.S.S. stand, where everything possible will be done to answer queries and give advice, or just chat, about this fascinating hobby.

Stand 107

Ashley Iles (Edge Tools) Ltd. is a small independent firm under the direction of the founder, specialising in the manufacture of Woodcarving and Woodturning Tools. For over 25 years, the requirements of the most discriminating craftsmen have been met with tools produced by traditional methods. The full range of tools will be on show together with exhibits, demonstrations and an invitation to "Have a Go".

Stand 108

Model aircraft competition exhibits.

Stand 109

J.N.T. Model Products Ltd. are distributors to the Trade of Guillows, Comet, Keelbild and Lindoe Flying Model Kits as well as producing their own range of Keelbild aircraft and marine accessories and tools. In the model railway field they produce a wide range of Thornton

Woodworker Section

Woodwork competition exhibits are displayed in Avon Suite 2
Judges include C. H. Hayward, H. C. King, G. Stokes, D. Shipton, W. Lincoln, and A. Talbot

CLASS WA: Cabinetmaking. Any piece of cabinet work of any size and style. Finish to entrant's choice

No.	*Description*	*Name and Town*
1	Occasional carved tripod table	P. J. Cartwright *(Stoke-on-Trent)*
2	Games Table	G. W. Maidment *(Wembley Park)*
3	Walnut and Oak Bureau	N. Batchelor *(Cirencester)*
4	Grandfather Clock	S. E. Dowse *(Paignton)*
5	Pedestal Table	S. E. Dowse *(Paignton)*
6	Pedestal Table	J. Dixon *(Epsom)*
7	Queen Anne Games Table	T. G. Hayes *(Farnham, Surrey)*
8	Chest of Drawers	N. S. Wright *(Stanstead)*
9	Needlework Box	A. S. McMurdo *(Harlow)*
10	Regency Chair	A. S. McMurdo *(Harlow)*
11	Semi-circular Side Table	J. Franck *(London, N.W.3)*
12	Trestle foot, gate-leg Table	R. E. Taft *(Penn)*
13	Regency Style Table	R. Albison *(West Bridgford)*
14	Mahogany Armchair	R. Albison *(West Bridgford)*
15	Regency Style Sideboard	R. Albison *(West Bridgford)*
16	Long Case Clock in Walnut	J. Craven *(Nantwich)*
17	Long Case Clock in Walnut	J. Craven *(Nantwich)*
18	Long Case Clock in Oak	J. Craven *(Nantwich)*
19	Coffee Table	Hampson & Day *(Bath)*
20	Pie-Crust Table	J. C. Roake *(Chertsey)*
21	Refectory Table	F. Bell *(Birmingham)*
22	Walnut Rocking Chair	M. F. Sunley *(E. Cottingwith, York)*
23	English Yew Windsor Chair	M. F. Sunley *(E. Cottingwith, York)*
24	Pine Writing Desk	P. Cockshoot *(Bromley)*
25	Pine Rug Box	P. Cockshoot *(Bromley)*
26	Grandmother Clock	P. Stewart *(Hillingdon)*
27	Child's Bed	C. Peberdy *(London, W11)*
28	Desk	C. Peberdy *(London, W11)*
29	Miniature Architect's Desk	B. Overton *(Tunbridge Wells)*
30	Miniature Four-poster Bed	B. Overton *(Tunbridge Wells)*

CLASS WB: Woodcarving. (a) Architectural — any piece of architectural carving, e.g. fireplace surround panel, church carving, any relief carved panel. (b) Any sculpture not more than 24 in. high. Abstract forms will not be acceptable

No.	*Description*	*Name and Town*
1	Ballet in Elm	R. W. Forsyth *(River)*
2	Germanic Knight Relief Panel	P. Sanford *(Walsall)*
3	Carved Stools	A. Lord *(Chesterfield)*
4	Cornish Tin Miners	J. Hunter *(Aylesford)*
5	Coat of Arms	N. S. Place *(Broxbourne)*
6	The Attack	R. L. Packman *(Southampton)*
7	Mice in Corn	R. L. Packman *(Southampton)*
8	Olympiad Wall Plaque	J. Dixon *(Epsom)*
9	Head on Plinth	B. C. Hills *(Chelmsford)*
10	Plaque Portrait	B. C. Hills *(Chelmsford)*
11	Presentation Rose in Box	B. C. Hills *(Chelmsford)*
12	Portrait in Relief	P. L. Davies *(Newcastle, Staffs)*
13	Indian on Horseback	S. Hatton *(West Malling)*

14	Rampant Black Barb Stallion	S. Hatton	*(West Malling)*
15	Eagle Owl — full size	S. Hatton	*(West Malling)*
16	Woodcarving	K. J. Allen	*(Cannock)*
17	Two Bears	J. C. Roake	*(Chertsey)*
18	Venus Panel	C. G. Manson	*(Braintree)*
19	Horse	C. G. Manson	*(Braintree)*
20	Boxer Dog	E. J. Noyes	*(Wickford)*
21	Kestrel	E. J. Noyes	*(Wickford)*
22	Tiger	E. L. Vince	*(Aylesbury)*

CLASS WC: Woodturning. In this section three set pieces form the basis for a single entry: (a) a table lamp, without shade, bulbholder or wire, not more than twelve inches high, made either from the solid or with a separate base but NOT from a built-up blank; (b) a bowl, with lid, not more than eight inches in diameter or more than three inches deep overall; (c) any piece of turned work to the entrant's individual design preference

No.	*Description*	*Name and Town*	
1	Woodturnery. Set Piece	G. Rowlatt	*(St. Albans)*
2	Woodturnery. Set Piece	G. Rowlatt	*(St. Albans)*
3	Woodturnery. Set Piece	B. F. Klingenspor	*(Harlow)*
4	Woodturnery. Set Piece	F. I. Ellis	*(Chesterfield)*
5	Woodturnery. Set Piece	I. Walton	*(Andover)*
6	Woodturnery. Set Piece	D. J. Moyles	*(Upper Beeding)*
7	Woodturnery. Set Piece	E. Philp	*(Callington)*
8	Woodturnery. Set Piece	S. G. King	*(Bournemouth)*
9	Woodturnery. Set Piece	J. S. Ambrose	*(Ely)*
10	Woodturnery. Set Piece	D. Jeremiah	*(Powys)*
11	Woodturnery. Set Piece	A. R. Holtham	*(Sandbach)*
12	Woodturnery. Set Piece	S. O. Smith	*(Leicester)*
13	Woodturnery. Set Piece	C. A. H. de Bourg	*(Trinidad)*

CLASS WD: Musical Instrument: Any string or wind instrument

No.	*Description*	*Name and Town*	
1	Celtic Harp	H. D. Lineton	*(Wembley)*
2	16th Century Bass Racket	P. Crosby	*(North Walsham)*
3	16th Century Tenor Kortholt	P. Crosby	*(North Walsham)*
4	Classical Guitar	L. A. Humphrey	*(Watford)*
5	Folk Harp. (Dythlyn)	T. B. Rosamund	*(Watford)*
6	Lute	M. P. Bulger	*(Seaford)*

CLASS WE: Marquetry and Inlay: Any marquetry picture or piece of inlay work

No.	*Description*	*Name and Town*	
1	Marquetry	B. F. Klingenspor	*(Harlow)*
2	Magpie	A. T. Murtell	*(Clapton)*
3	Marquetry Pictures (3)	C. Good	*(Finchley)*
4	Marquetry Table	M. Young	*(London, N8)*
5	Marquetry Box	M. Young	*(London, N8)*
6	Marquetry Pictures (3)	J. E. Daykin	*(Brussels)*

CLASS WF: Miscellaneous, Fretwork, Pyrography. Any piece of work, fretwork, pyrography or any work not covered by other categories e.g. full size working spinning wheels, woodworking tools or devices

No.	*Description*	*Name and Town*	
1	Set of Marking Gauges	U. K. Gerry	*(Wembley)*
2	Monmouthshire Waggon and Shire Horse	S. Norton	*(Pudsey)*
3	Small Long Case Clock	R. Palmer	*(Crowthorne)*
4	Two Pyrography Plates	B. Clark	*(Bingley)*
5	Welsh Love Spoon	A. Davies	*(Cardiff)*
6	Cigarette Box	H. E. Ellis	*(Chesterfield)*
7	Gypsy Caravan	D. W. Neville	*(Wembley Park)*
8	'L' Game	Hampson and Day	*(Bath)*
9	Three Kitchen Plaques	Mo. P. Joslin	*(Springfield, U.S.A.)*
10	Walnut Jewellery Box	B. Overton	*(Tunbridge Wells)*

Scenic accessories as well as plain and moulded brick, slate, etc., and plastic sheet for scratch builders. On show also will be their new range of British railway building kits. In the plastic kit field such leading manufacturers as OTAKI and L.S. are distributed in the United Kingdom by J.N.T. See also the Thornton Battlegrounds.

Stand 110

Harry Butler (Models).

Stand 111

Elkay Enterprises.

Stand 112

Carts and carriages have always been attractive subjects for models, but few people used to tackle them because of the lack of good plans. Now John Thompson is offering very fully detailed "Model Wheelwright" working drawings produced from painstaking measurement of the surviving vehicles in museums. The fascinating selection ranges from simple farm carts which the novice could tackle to elaborately decorated Gypsy caravans which are a challenging project for the enthusiast. The 1977 catalogue includes a directory of suppliers of materials, and a lot more information and advice. A new book by John Thompson explains model wheel construction in great detail. The stand features a display of models made from the plans.

Stand 113

Arnold & Walker was started in 1974 by two life-long enthusiasts for woodworking and woodworking tools, Roy Arnold and Philip Walker. They specialise exclusively in "The Traditional Tools of the Carpenter and other Craftsmen" and believe that they are unique in this respect. They write and publish material about tools, sell books and, of course, buy and sell old and antique tools. Their catalogues contain much information as well as hundreds of illustrations of interesting tools. Arnold & Walker has a shop in Needham Market in Suffolk where they have a warm welcome for fellow enthusiasts.

Stand 114

English Abrasives Limited are manufacturers of Coated Abrasive Products in all types and shapes suitable for the Model Engineer or Woodworker. Standard items include Sheets — Coils — Rolls — Discs and Belts for hand use or on power assisted tools, and the range of grits include — Emery — Crocus — Garnet — Aluminium Oxide and Silicon Carbide. Backings are of Cloth, Paper or Fibre together with Waterproof Paper. We also feature on the stand new FLAPWHEELS and a Rotary Sander designed for the Home Workshop Technician.

Stand 115

Record Ridgway Tools Ltd. will be showing a fully comprehensive range of Wood Turning, Woodsculpting, Woodcarving and Woodboring tools, together with a selection of tools from the Record Ridgway range which includes cramps, planes, wrenches, vices, mitre cutters, chisels, dowelling jig, hammers, holding and mitreing tools, screwdrivers and bradawls and flatbits, etc. Record Ridgway will be giving lecture and slide demonstrations throughout the exhibition which will include woodturning, woodsculpture, woodcarving, creativity in wood — a new craft — plug craft, furniture making with a dowelling jig, carving with a router, care and maintenance of woodwork tools and enamelling. Slide lectures will include choosing and fitting a vice, woodboring tools for hand and machine use, chisels and chiselling, planes and planing.

(continued)

Stands 116/117
E. P. Barrus Ltd.

Stand 118
On show at Simbles is a large range of Woodworking, Lapidary, Transmission Equipment, Hand Tools and Machinery. Probably one of the largest Tool Mail Order firms in the country, special arrangements have been made for orders taken at the exhibition to be despatched within 48 hours — direct to your door. Access/Barclaycard accepted. A comprehensive CATALOGUE, complete with price list is available, price 30p, or free with order of £5 and over. We have a large permanent display of our Tools and Machines at our premises in Queens Road, Watford.

Stands 119/122
Trend-Elu Machinery Ltd.

Stand 120
Coronet Tool Co.

Stand 121
Sarjent Tool Stores.

Stands 123/124
Suzemihl UK Ltd.

Stand 125
Kity UK is the exclusive importer of a French-manufactured range of woodworking machinery for the discerning DIY carpenter and the smaller professional builder or joiner. The range of products includes circular and band saws, surface planers, thicknessers, spindle moulders and slot mortisers — all available as individual machines or in a unique configuration achieved by mounting individual machines around a central motor on a work bench.

Stand 126
Evans Brothers are publishers of some of the finest woodworker books for the craftsman. Charles Hayward, probably the most respected and admired writer in the field, is well represented with 15 books. Another well-known author is Gordon Stokes, whose woodturning books are extremely popular. All Evans' woodwork books on cabinet-making, turning, antiques and almost all aspects of the craft, are fully illustrated with photographs and scale drawings. Evans Brothers Limited, Montague House, Russell Square, London, W.C.1. Copies of all Evans' woodwork titles are available direct from Stobarts, 67-73 Worship Street, London, E.C.2.

Stand 127
Rustins Ltd. of Waterloo Road, London, N.W.2 will be showing their extensive range of wood-finishing and decorating products on Stand No. 12[illegible] There will be continuous demonstrations of Plastic Coating, a cold cure lacquer, which gives a heat, solvent and abrasion resisting finish. Among the many other items of particular interest to woodworkers will be Gloss and Matt Polyurethanes, French Polishes, Teak Oil, Danish Oil and a range of Grainfillers and Woodstopping. Strypit Paint Remover, which removes all types of finishes without harming wood, will also be demonstrated.

Stand 128
Barrie Voisey Plans.

Stand 128a
Woodworker magazine.

Stand 129
The Art Veneers Co. Ltd.

Stand 130
Lervad (UK) Ltd. offer a complete range of Danish designed benches for all types of craftwork, do-it-yourself and home handyman activities. On show at Wembley will be the new 610 bench which is fitted with three work holding facilities — a full width tail vice, shoulder vice, and a double row of bench clamping dogs, and the 611, a larger version of the 610 providing a greater work holding capacity and larger working surface. Safe storage of tools and materials is a feature of the 610 CU and 611CU benches which have fixed cupboard accommodation beneath. Full details are available from Lervad (UK) Ltd., 18 Crendon Street, High Wycombe.

Stands 131/132
Stanley Tools Ltd.

In addition, showcases contain displays of other trade items etc.

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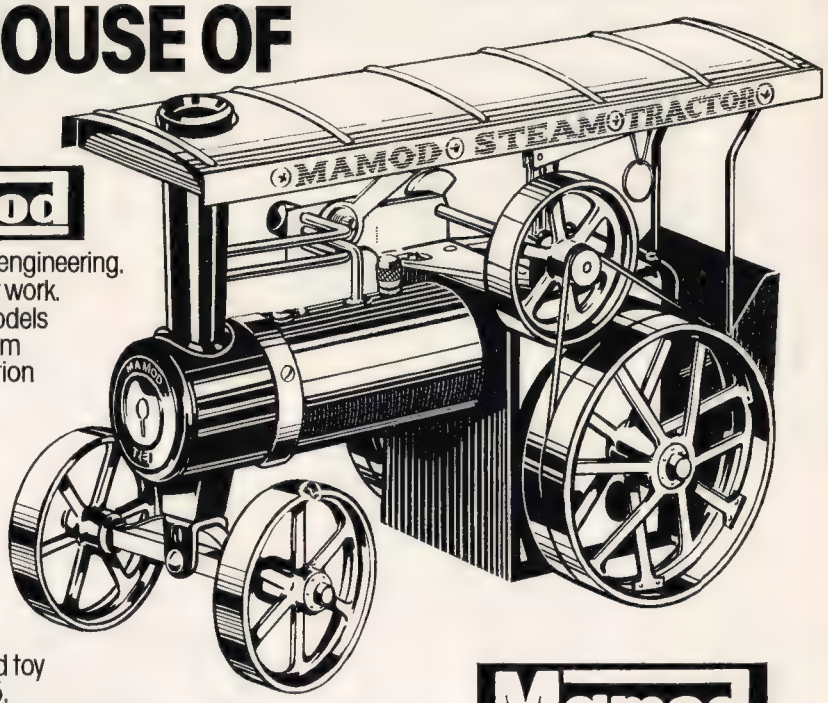

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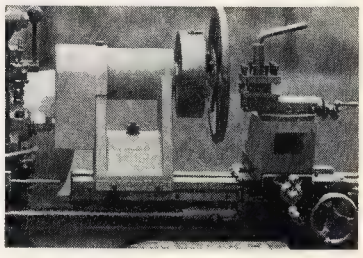

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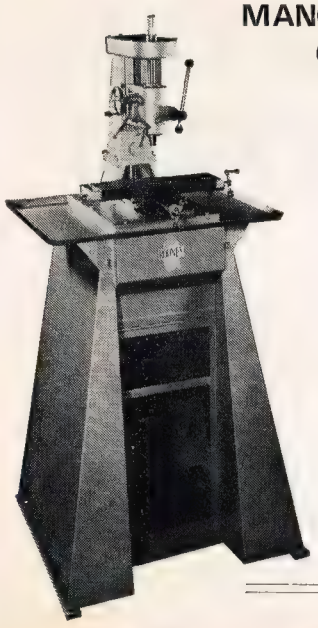

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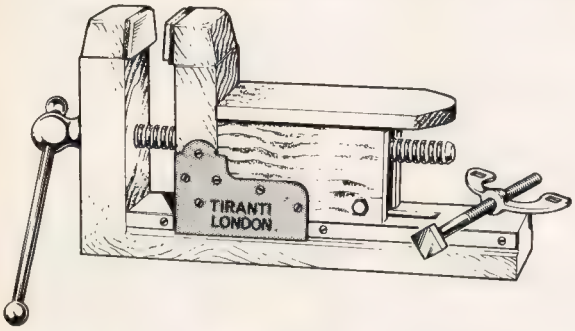

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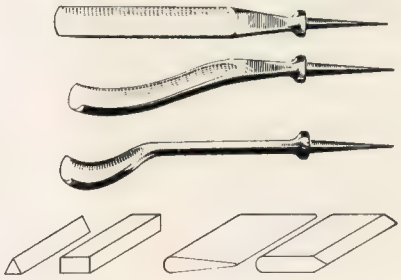

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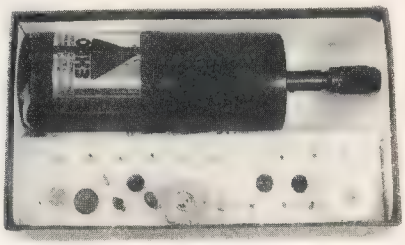

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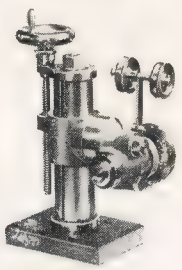

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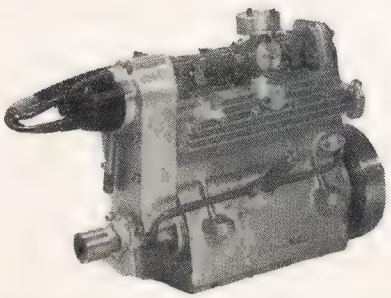

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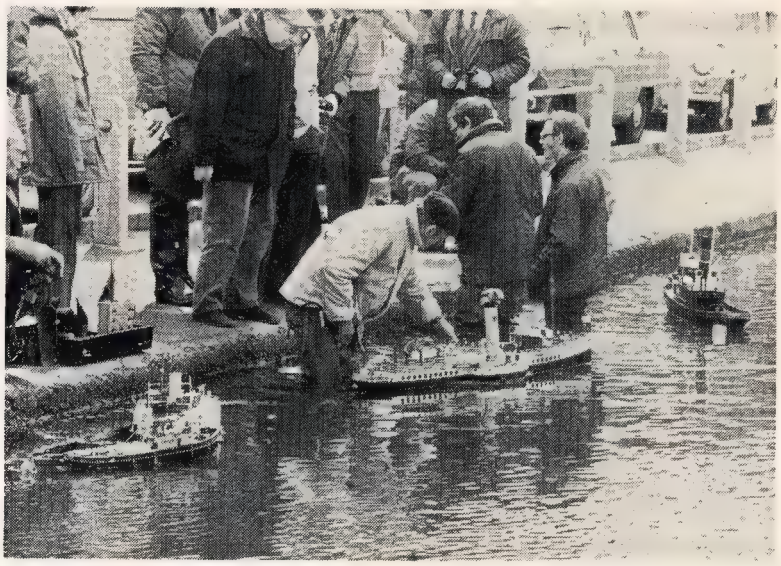
Jim King, MAP Ltd. Promotions Manager and M.P.B.A. International Secretary,

anticipates a return of steam power



STEAM, a magic word that brings to mind throbbing pistons, heat and the smell of hot oil. Generally associated with memories of the immediate past, steam plants are possibly the only one of man's inventions that seem to be gifted with a life of their own. Still used as power in many of the world's largest ships, steam declined as a source of power for the miniature counterpart under the onslaught of the readily available internal combustion engine.

Many lovers of steam propulsion, and there *are* many, temporarily deprived of the pleasure of following their fancy, made use of the commercial internal combustion engine and also the easily obtainable electric motor, but there was always a strong contingent of steam users on the North East Coast and in East and South London.

With the present attitude to noise and pollution, the i/c engine is under attack because of its sometimes unacceptable noise level; silencing is always suspect and many of its devotees do not help matters by ignoring the need to consider the feelings of others, with the result that bans on the use of noisy, and unfortunately, too often, *all* power boats come along with monotonous regularity. The result is that increasing numbers of boaters are looking for a quieter boating scene. Some turn away from power and defect to the ranks of sail, while others seek the answer with the use of electric or steam. Both these media have an advantage over their rival in respect, generally, of the noise generated in operation, but this is not always so, as anyone who has watched electric R/C speed or tethered steam hydroplanes will testify.

The steam power enthusiast in the past has usually been in possession of full workshop facilities and the ability to make his own power plant, or has the wherewithal to be able to purchase some or all of his needs. With the soaring costs of i/c engines, the part sets and completed steam engines now on the market have made the steam plant an economic proposition for many of those who are turning away from the i/c engine.

More people also have leisure time that has to be filled, so that an instant package power plant no longer has attraction for them, and all signs foretell a revival of steam as a major power on the waters of the power boat enthusiast.

This view is strengthened by the increase in numbers of steam boats to be seen at regattas and being run for fun. Of course there are the diehards who have always used steam, with boilers fired by oil or on rare occasions by coal, users of the latter not minding their appearance as members of the "Black Gang" at the end of a day's running. Modern practice making use of bottled gas is cleaner than previous fuels and is a step towards making the steamer easier to handle and increasing its popularity.

Are we then seeing the beginning of a revival of steam on the water? All indications are that we are, and one can only hope that the supporters of this revival will grow in number. Past use of steam has generally been mainly restricted to boats designed for straight course running, and some of the specimens in current use have been around for a long time; many have changed hands and been rebuilt several times, longevity being another advantage of a steam plant. Most present-day users of steam tend also to favour the straight running course, and all types of craft can

Scale models, especially if steam-powered, always attract spectators, as evidenced by the paddle-steamer and three tugs (one a paddler) at Blackheath (above) and a clinker launch at Maidstone (left).

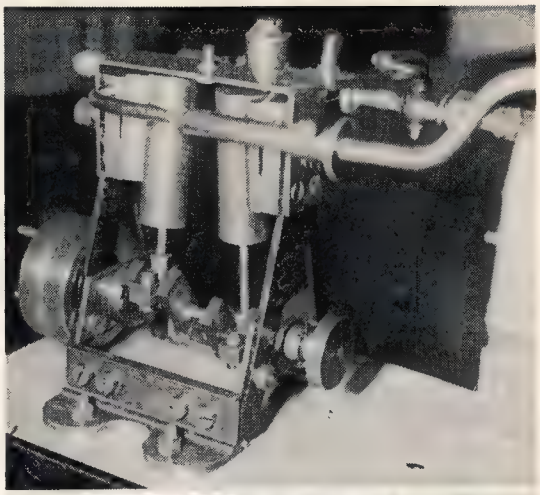
be seen in these competitions. Functional craft, usually of the displacement launch type with a fairly long hull as typified by the North East coast boats, or planing types as used by the Blackheath Club, have been frequently seen over the years, but most new construction seems to favour scale or semi-scale types of boats, using a centre flue boiler and one of the Stuart Turner No 10 engines (single or double).

Radio control of steam until recently was not popular, probably due to the problem of insulating the control equipment against the heat, but with a trend towards the larger ship coupled with smaller R/C equipment more people are turning their efforts toward combining one of the older forms of power with an up-to-date control system, with highly satisfactory results. Like their straight running confreres, the R/C man has tended to favour a scale model, and the result generally is one that pleases both the builder and the lake-side spectator. Again the Stuart engines are generally favoured, but recently several examples using imported Japanese plants fired by methylated spirit have appeared. To be most effective a power plant must be capable of easy starting and reversing under control, a factor that up to now has given the electric motor the edge over its rivals in this field, and two cylinder (or more) double acting engines are a must to give the results required easily. But of course the methods applied to i/c engines can also be used for steam, if one is prepared to have the engine running continuously.

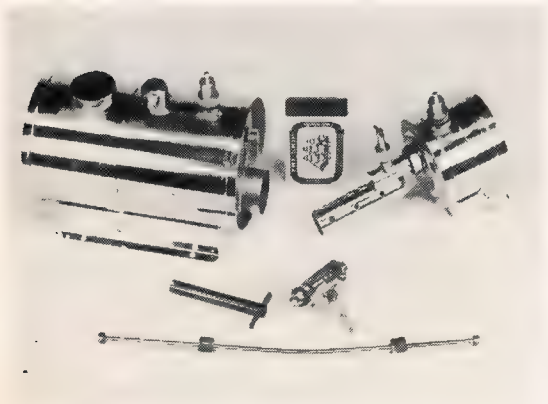
Some quite simple power layouts have been seen on the water during the past season and several enthusiasts have found enjoyment in the operation of boats driven by the simple oscillating engine and under radio control. A few of the Japanese two and three cylinder plants made their appearance, and if sales of these plants are anything to go by, then a noticeable number of new steamboats are due to appear on our waters shortly.

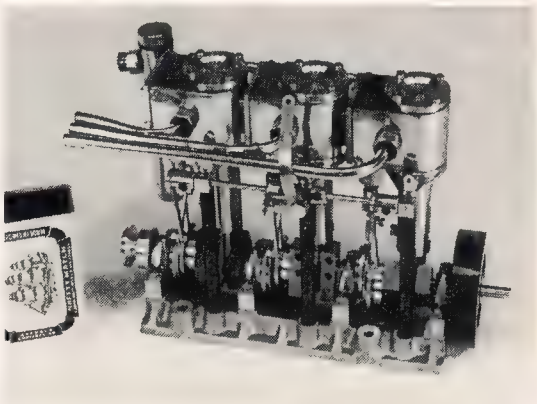
What of that other facet of steam, the hydroplane? Very much a specialist field, devotees of this side of the hobby have to be very dedicated. But again there are new faces appearing among the ranks, something that was lacking in the immediate post-war years, and, who knows, success may come their way and some new names will be added to a very select band of enthusiasts.

So it looks as if the oft-times expressed hope of the live steam mariner will be fulfilled and more sounds of steam, whistles included (suitably silenced to conform to the 80 dBs limit!) will be heard on the country's waters in the coming years.



A simple twin oscillating engine as in the top picture can be made with hand tools, using tubing for cylinders and pistons. Above, a Belgian competitor at an English regatta with an attractive steam pinnace. Below, a Japanese commercially-available three-cylinder steam engine with, left, its vaporising methylated spirit burner and boiler, etc., also made in single and twin cylinder forms.





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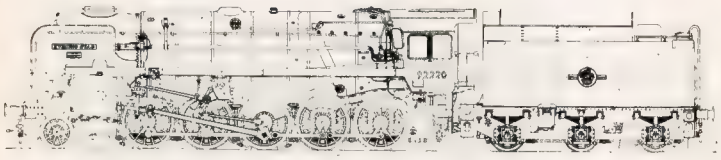

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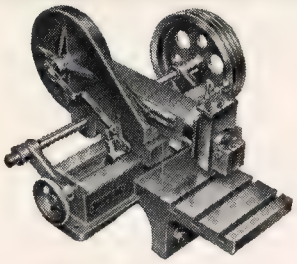

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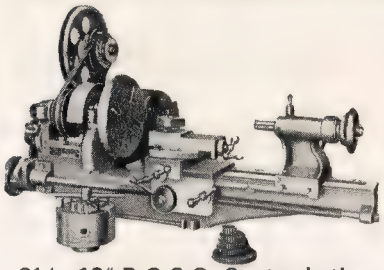

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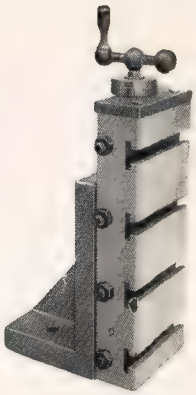
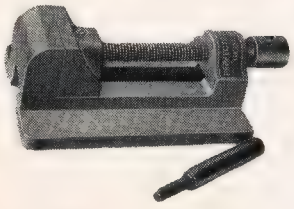
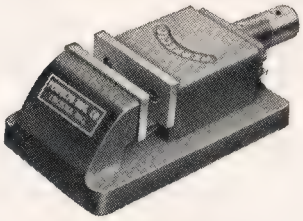


Vertical Slide



Vertical Slide Vice



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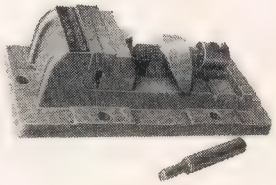

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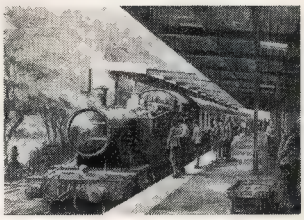

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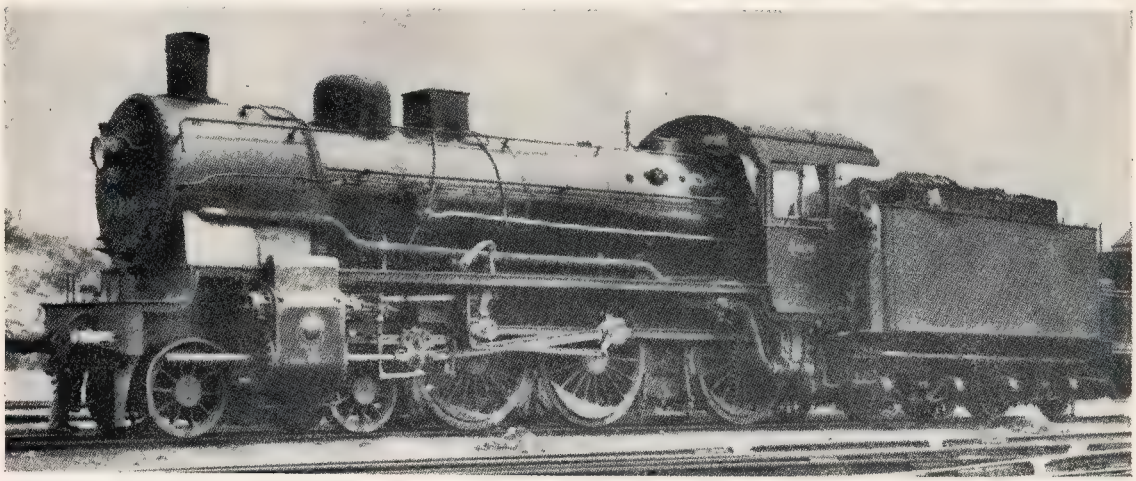

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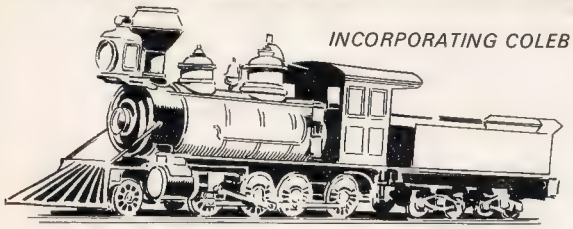

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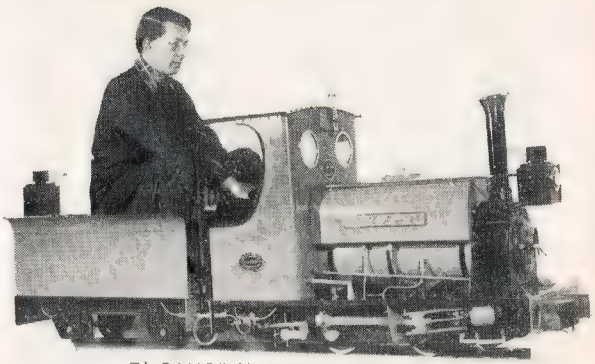

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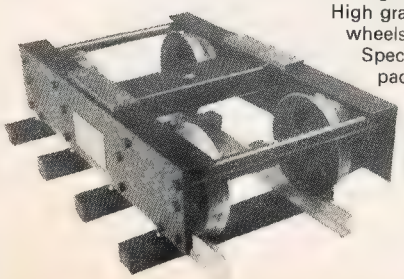

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RADIO CONTROL TRENDS

By Jack Barnard

Assistant Editor
Radio Control Models

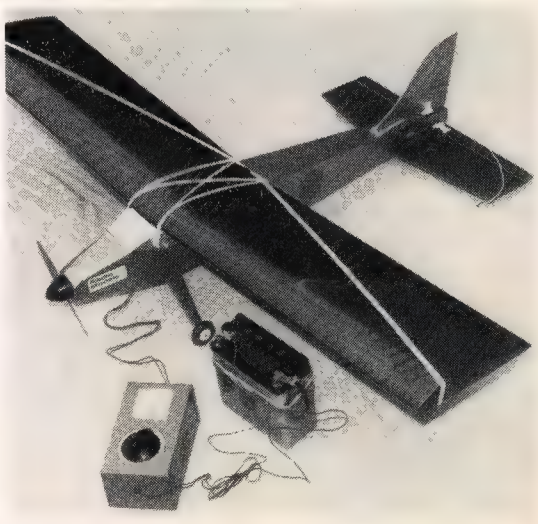
TREND is defined in the English dictionary as "a general tendency", "direction", or "to take a certain course", but no distinction is made between courses taken by choice and those forced by necessity. One course which by necessity must now be taken by both modeller and manufacturer alike is the one which leads towards the suppression of noise and the improvement of good public relations.

Manufacturers of model internal combustion engines continue their search for power and speed; today's .40 cu. in. motors produce the equivalent power of yesteryear's .60s. The miniaturisation of Radio Control equipment and high cost of fuel has aroused interest in the smaller model powered by relatively economical motors in the .15 cu. in. to .25 cu. in. range; these are also improving in power output and reliability. It is unfortunate that, in the past, improvements to the performance of engine silencers has not received similar attention, but it is possible that limited demand did not warrant the necessary outlay of capital for research purposes.

The pattern is, however, changing; the British market is no longer in the minority in the "search for silence" and modellers of many other countries are involved in similar noise pollution problems to our own. Manufacturers of model engines, in this country and abroad, are now turning their attention to the production of "real" silencers, to be sold as a standard part of their production motors.

The "silent flight" of sailplanes is growing in popularity and we saw evidence of the greater interest in thermal soaring at contests in the latter months of the 1976 season, where entries had increased beyond all expectation. Slope soaring, too, is becoming more popular and soarers are becoming more "contest minded", as shown by the increasing numbers of slope pylon races and scale glider events advertised in the Contest Calendars of R/C model magazines.

The relative quietness of electric-powered models is attracting the interest of modeller and manufacturer alike. Electric-powered models in kit form, complete with power units, have appeared on the shelves of model shops and various-sized power units and purpose-designed power packs are now easily obtainable for modellers who wish to design their own machines. Research in this field continues and we expect to see more efficient and attractive electric power designs in 1977. The most outstanding advance has been made by the Graupner research team, which recently successfully flew the *Solaris* solar powered R/C model aircraft and we look forward to seeing the



Above: The large scale Lancaster of the Jim Davis display team needs a special C.A.A. permit to fly.
Left: Solar-powered model developed by the late Fred Militky.
Below: Battery charging of an electric R/C model.

results of their experiments on the model shop shelves in the not-too-distant future.

The internal combustion engine will no doubt be silenced to "aceptable" standards by manufacturers' ingenuity and interest in many fields of internal combustion engine powered R/C modelling is showing a marked increase. Model helicopters, until recent years considered an "impossibility", are becoming increasingly popular with "mechanically minded" modellers. Club 20 racing has "confounded the experts" by enjoying the largest boom of all and there is a greater demand for plans and kits of models suitable for this sport. The comparatively low cost of building these small models and relatively economical operation of the .20 cu. in. motors used are undoubtedly contributing factors to the popularity of this sport.

Scale and semi-scale models are predominating the scene in all fields of R/C modelling — planes, helicopters, cars, boats, gliders; and even scale Club 20 pylon racing models, such as Spitfires, Sea Furies, etc., are appearing at competitions. There are few open contests which do not include a Class 2 scale event and the first International competition for R/C stand-off scale models was held concurrently with the 1976 World R/C Scale Championships at Dala Airport, Sweden.

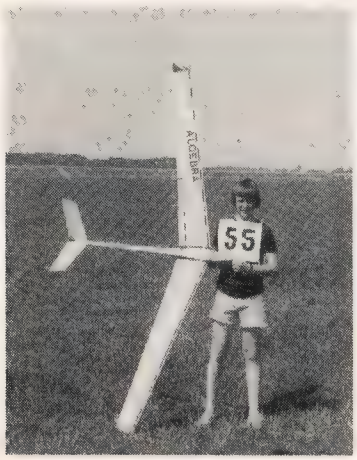
Above, left: A good start to a Club 20 R/C pylon race; undercarriages are dispensed with.
Right: A line-up of helicopters at a 1976 contest. Difficult to fly, they have a fascination of their own.

The market in radio control systems has become very competitive and manufacturers have concentrated on miniaturisation, reliability and keeping prices down. Miniaturisation has slowed and manufacturers are concentrating on the development of more selective equipment which will bring complete security at 25 kHz frequency spacing, the need for which is becoming increasingly acute. "Add-on" safety devices for radio control systems are appearing on the market, some monitor the condition of battery packs and give warning when power drops to a critical voltage, others, fail-safe units, operate selected servos when battery power falls below a pre-selected voltage, closing the throttles of power models or de-thermalising gliders by holding on full up-elevator.

Another trend of our sport is that it is attracting enthusiasts from a wider age bracket. The older man, who "gave up modelling years ago", is rejoining the "balsa brigade" with radio control, and in 1976 we saw winners in radio control competitions who were still in their early teens.

Finally, the "general tendency" which must be halted, the loss of our model operating areas through noise complaints; I would urge all modellers to take a "certain course" in 1977 towards greater safety, tolerance, consideration for others, and by so doing, help to reverse this unwanted trend.

Below, left: A junior competitor with a successful thermal-soaring R/C sailplane. Twelve and fifteen footers are common.
Right: R/C car racing, using 2½ cc. motors is always a crowd-puller.



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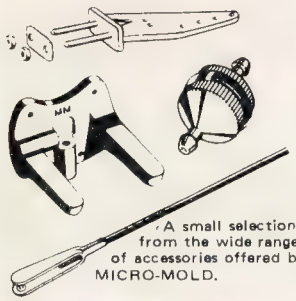

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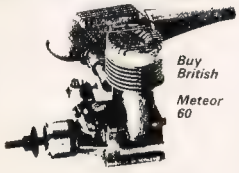

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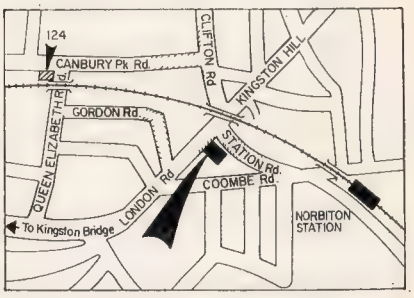

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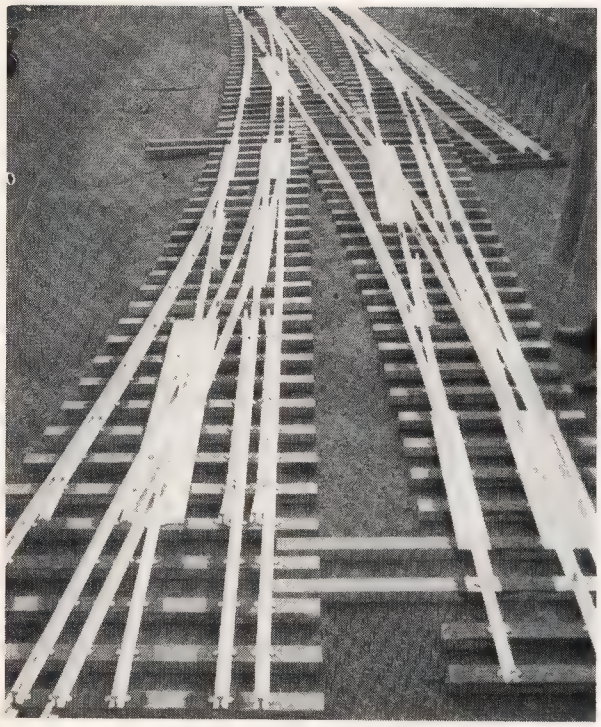

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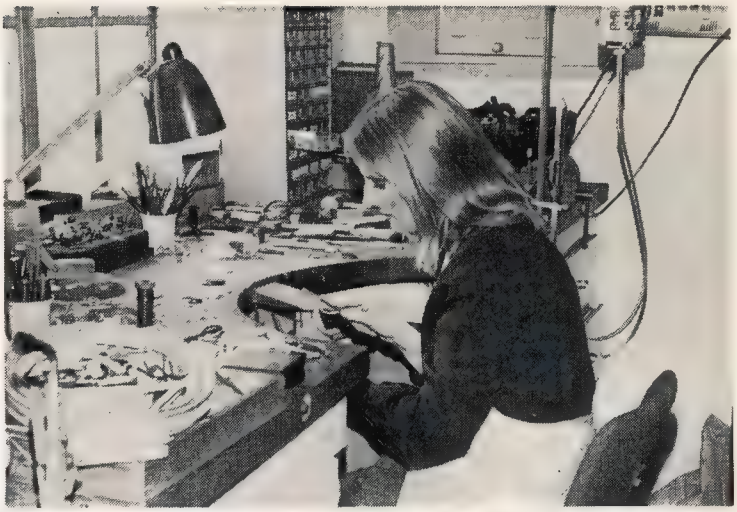
GEM CRAFT

—the perfect complement to model engineering, says Evelyn Barrett, Editor of 'Gem Craft'



Most Model Engineers already have the tools needed for silvercraft — Right: A silvercraft woman at a traditional jeweller's bench.

THERE is probably no craft as tailor-made for the Model Engineer and his family as Gem Craft, and there is no hobby that needs less capital to start it off.

Almost every family has a collection of pebbles and interesting stones that they have picked up while beachcombing. Now is the time to shine! Make the wife and kids a simple tumbler to polish the pebbles — GEM CRAFT can tell you how. Or if you are too busy on that engine or other project at the moment, then you can cheat and buy one ready made from about £10.

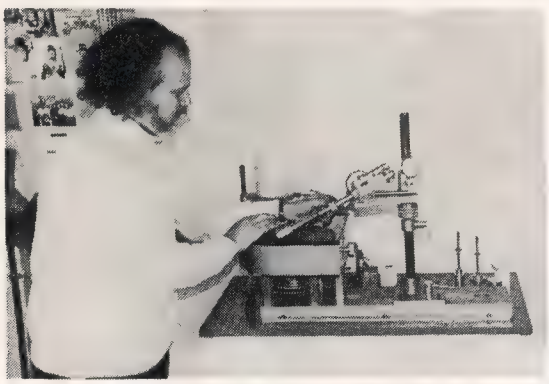
This will keep the family occupied for about six weeks, changing the grits and so on, and then they will have a pile of beautifully polished natural gem stones.

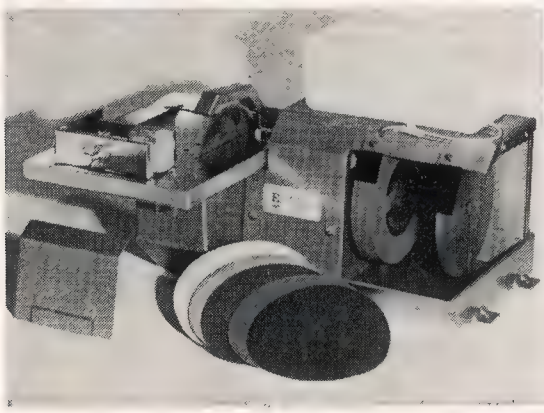
You then have a choice — take them off to the seaside to look for some more or start them on jewellery making.

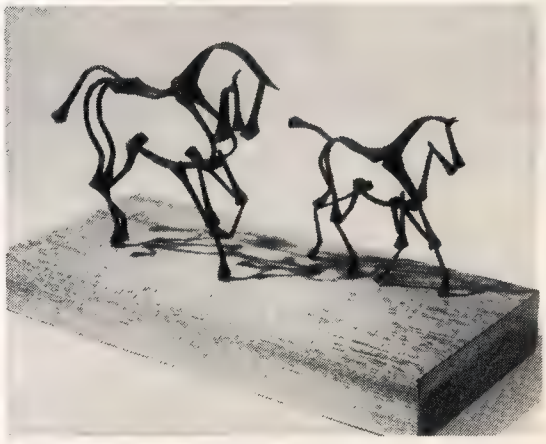
Well, it's a bit cold, so how about sending for some catalogues and looking at the bits and pieces they sell ready made for jewellery — "findings"? They are all a little stereotyped, though, and that particularly lovely agate really deserves something better. Look a little further and you will find all the materials for silvercraft: you already have most of the tools. Silver soldering is so simple — why not make your own unique mount? Silver is surprisingly inexpensive and when you have finished you can have your piece hallmarked. You are on your way to laying down family heirlooms. Better take GEM CRAFT for the latest designs.

What's this? Lost Wax Casting? Look into it, for as well as making jewellery, you could, if you have any time left, cast a few useful pieces for the engine; the technique is basically the same, whatever the metal.

You probably haven't realised it but you are already halfway to becoming a "Gem Bug". You suddenly become dissatisfied with just pebbles. That silver setting deserves a specially shaped stone, a cabochon.







Left: Fascinating faceting, this machine was hand built. Below left: A 6 in. Combination lapidary machine enabling sawing, grinding and polishing to be done on one machine and below: Sculpture in horseshoe nails, another GEM CRAFT subject which will particularly appeal to the Model Engineer.

Look in at your local craft shop. They have rough jade, lapis lazuli, rose quartz, tiger-eye, all begging to be shaped. They also have the machines. You can get a combination saw, grinder and polisher from about £60 or you can make your own. It is not difficult and you can then tailor the machine to your needs.

You can even think about cutting opal — the queen of stones with hidden fire. Once you catch opal fever you are lost. You may not even want to go on faceting.

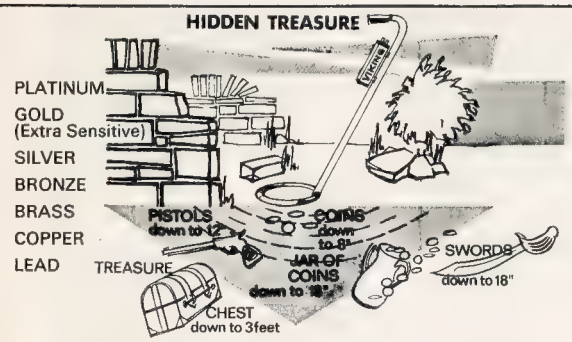
If the wife makes a nuisance of herself begging to be allowed a turn on the grinding wheel, to cut a few stones herself — set her up with an Enamelling kiln. She might even start making money — enamel pendants are best sellers.

The children may insist on going to the beach to look for more pebbles. While they search, spend a happy afternoon with a treasure detector, finding coins, rings and jewellery lost months, years or even centuries ago. Yet another facet of Gem Craft.

Alternatively, you can spend the time looking for even bigger and better pieces of agate to slice and polish, because now you are hooked. You are a Gem Craft Rockhound.

GEM CRAFT is published by Model and Allied Publications on the second Friday each month: price 30p with four pages of full colour every month. Look in at the GEM CRAFT stand and find out more about it NOW.

The many facets of GEM CRAFT — Clockwise; Rockhunting; cracking a geode on the incredible geode cracker; Faceting again on a flat lap combination machine; a surprise silver egg lovingly crafted for a grandchild and finally, Lost Wax casting — heating the metal in preparation for centrifugal casting.



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Making a Start in Model Engineering

Some extremely sound advice from M.E. Technical Consultant Geo. H. Thomas

AMONG the thousands of people who visit Model Engineering Exhibitions up and down the country there are large numbers who are not only fascinated by the beautiful models which they see but who wish that they were able to do something like it themselves, though not necessarily aspiring to the high standards of the exhibits. But, "How does one start?"; "How does one learn?"; "What would I need?"; "How much would it cost?" and so on. An hour or so in a quiet corner with an "old hand" would do much to dispel any doubts and set the would-be model engineer on the right track.

I have been invited to write a few words about starting and equipping a workshop and I am trying to put myself in the place of one of those visitors to the exhibition, an exercise which I find rather difficult because tools have played an important part in my life for as long as I can remember — even as a very small boy using my mother's cutting-out scissors for cutting cocoa tins to make "boilers", and I could never understand how she knew!

I will start by answering a question which is rarely asked "*When* do I start?" The answer is NOW. It is never too early to get started but it can easily be too late. Try to get established in the hobby with as much of the equipment as you can afford well before retirement time, for there is an understandable reluctance on the part of retired people to spend much money on hobbies, even though hobbies — especially "creative" hobbies like model engineering — are life-savers. Consult any doctor. So get started, even in a small way, as soon as possible, for the more time you have before you the more you will be able to accumulate knowledge, equipment, materials and acquire the necessary skills which can only come with practice.

One of the difficulties I am faced with is that I have to address my remarks to a very wide spectrum of people; young, old, those with some knowledge or skills (apprentices or those engaged in some branch of the engineering industries) and, on the other hand, a clerk in an insurance office or someone in the "rag-trade". There are those with ample funds and the financially less fortunate. It will be clear that the answers to the questions which arise in the visitor's mind will, to a large extent, depend upon his particular circumstances but it is hoped that the following notes, which are based on my own experience, will be of some help to all those who wish to get started in the finest of all hobbies.

First buy some books on workshop practice; I use the plural because any one book might have "gaps" or omit to mention some important point which another book might very well cover. Available books vary in their usefulness — some I would classify as "catalogue engineering" but some others are really helpful. For a start, I would have no hesitation in recommending "In the Workshop" by Duplex, and L. H. Sparey's "The Amateur's Lathe", but M.A.P. or the *Model Engineer* would be only too willing to give advice. There is frequently a very good selection to be found in your Public Library. Whilst reading your books, try things out for yourself, remembering that reading alone will not give you any skills but it will point the way and save much lost time and disappointment. By the same token, a man is not a model engineer simply because he has a workshop full of tools; he must be able to use them. I say this because some people place too much importance on the accumulating of tools and equipment which, after all, are only a means to an end.

All model engineering societies have at least some members who would be only too pleased to help a beginner, so join a local society — hopefully, one not too narrow in its activities. Many technical schools run evening classes in metal-working and machine-shop practice and some now have special classes for model engineering, and if you are lucky enough to have such facilities in your locality you should endeavour to join a suitable class, either to learn basic skills or to have available to you the use of machines and processes which are lacking in your own workshop.

We come now to the nub of the matter — the workshop and its contents. So far as the siting is concerned there is little that I can say which will not be obvious. The ideal place is in the house; warm, dry, no rust problems and light refreshment passed through the door at appropriate intervals. In certain circumstances there is also the advantage that the man is "in" and not "out". Spare bedrooms are perfectly satisfactory and the commandeering of such a room might even provide bonuses in other directions! I have had three workshops in second-floor attic rooms but these tended always to be very hot in the summer. Many people make do with the end of the garage but there can be serious problems arising from wet (and hot) cars at night. If the garage is large enough it might be possible to partition off the end portion. A friend living near me has had an extension built on to the end of his garage and this has made a very good workshop. Perhaps the majority of workers use an outside building of timber construction and these can be made reasonably comfortable but, usually, they are not and, in a sort of love-hate relationship, they become known as "the shed". They should be erected on a concrete floor and the space between the frame members filled in with mineral wool and sealed on the inside with white-faced Celotex. Roof insulation is all-important and don't leave the concrete floor uncovered — it is cold to the feet and hard on anything dropped on it as well as being dusty. Thick linoleum is an excellent cover (and expensive!) and so is timber in the form of narrow T & G boards set in bitumen. The man who wants to do small work only can set up shop, complete with a very small lathe, in an old roll-top desk.

For the pursuit of serious model engineering a lathe of some sort is essential but for the beginner who has had little or no experience in using tools I would recommend that a start be made using hand tools only and learn the basic skills of benchwork; marking out, sawing, filing and drilling, etc. Learn to drill a hole where it is wanted; to tap a hole without breaking the tap and to file down to, and split, a scribed line. With a small kit of bench tools it is possible to make a wide variety of useful small items including simple tools and workshop aids. It is possible to do a lot with a simple hand-drill but most people today own an electric drill-gun which can be mounted on a stand, purchased or home-made, as a makeshift drilling machine. I stress the word "makeshift" because for serious work later on such an arrangement cannot be regarded as a substitute for a small drilling machine.

It would be a waste of time to submit a catalogue of tools so I shall merely comment on a few. Files are not only essential, they are also much abused. One cannot hope to do good work with a few files which are only

suitable for filing horse-shoes or stirring paint! You will need a few 8 in. or 10 in. fairly rough files for getting through the work quickly and you will need some fine ones in 4 in., 6 in. and 8 in. sizes in various cuts. I have used Swiss files (by which I mean files made in Switzerland) for many years and these are graded from 00 down to 8, the most useful cuts for small work being 2 and 4 either "hand" (one safe edge) or "pillar" (two safe edges). Unfortunately, these are now very expensive but it should be possible to find satisfactory British equivalents. In addition, a few other shapes will be useful — round, half-round and knife. As with files, a hacksaw which has been used on steel, especially silver-steel, will not be a very good proposition for sawing brass, so reserve a new blade for sawing brass — better, have two saws. The blades should be 10 in. HSS; there is no virtue in a 12 in. saw, it costs more and breaks more readily. A "Junior" Eclipse saw is invaluable.

Metric drills are a much better proposition than "number" and "letter" drills in which the grading of sizes is quite haphazard (e.g. between 30 and 31 the difference is 8½ thou.: but between 34 and 35 the difference is one thou.). Metric drills are made from .3 to 1.0 in increments of one thou.; from 1.0 to 5,0, two thou.; from 5.0 to 13.0, four thou., so there is a metric drill to cover all the number and letter sizes and many more in between. If it is desired to economise in the first instance, buy only the tapping and clearing size drills for the threads you are likely to use, together with an assortment of inch fractions.

In view of all the talk about metrication it would take the wisdom of Solomon to give sound advice about screwing tackle. For fastenings I like BA and I have no intention of changing. It is metric and the series is scientifically based, each screw being nine-tenths of the size of the next larger one. There is no real alternative at the moment so I suggest taps and dies for BA sizes from 2 to 10 (even numbers because of scarcity of odd-number screws). For making workshop appliances, ¼ in, and 5/16 in. BSF and for model work the M.E. threads (40 and 32 tpi) are essential.

We now need some marking-out and measuring tools, an elementary kit for which would include one *very good* rule with fine graduation lines. There are on the market some very attractive dull-chrome plated rules which are nice to use but the plain steel ones with sharply incised lines are much better for setting dividers, etc. Scriber; 4 in. square (and preferably a 2 in. also); 2 in. toolmaker's dividers and a larger pair (trammels you will enjoy making later on); a fine centre-punch (the two I always use are home-made, all the others including an automatic one, are ornaments) which should be used only on accurate work. For "garden-gate engineering" any old centre-punch will do. You will need something for measuring angles; out of a whole collection I think that the M & W No. 45 is the most useful for a start. Don't spend a lot of money on a "Combination Set"; I have a beautiful one with protractor head — all hardened — (present cost over £25) which hasn't been used for years. An 0 to 1 in. micrometer is an essential tool — or certainly will be as soon as you buy a lathe — and the range can be extended by a 6 in. vernier slide-gauge but nothing can replace the 0 to 1 mike.

Having acquired some tools and learned to use them, some thought can be given to the purchase of a lathe. Here, the choice is fairly wide and the machine selected will depend to a large extent on the money which can be spent on it — though "invested" might be a more suitable word today. The lathe is the first machine tool to be installed because it is the most important. In addition to its primary function of turning, boring and screwcutting is can, with the aid of attachments, be used for a wide range of other operations, especially if it has been made with this versatility of purpose in view, as are many of the lathes in the 3 in. to 4 in. size which have been designed to meet the needs of the amateur. Some makers of lathes in this class (notably Myford Ltd.) offer a very wide range of attachments and extras for their machines and these can be purchased from time to time as the need for them arises or, having developed some skill and confidence, many such accessories for the lathe can be made by the owner. The most important attachments for the lathe are those which enable milling operations to be carried out, and whilst a milling machine might be a desirable addition to the workshop, it is by no means essential. One of the finest locomotives ever built, one which received the highest awards, including a special Gold Medal, was made with a 3½ in. Drummond lathe, purchased more than 50 years ago, as the only machine tool. The lathe should be of a size suitable for the class of work contemplated and *never* too small. About 3¼ in. to 4½ in. centre height will meet practically all requirements.

Little or nothing can be achieved without a tool-grinder and these, like everything else these days, are becoming very expensive. A 6 in. double-ended grinder is the best but I would advise the purchaser to remove the two grinding wheels and give them to his worst friend, then fit two new wheels of a more suitable nature. My own preference is for white aloxite, vitreous bond, medium soft grade, one coarse and one fine — the wheels frequently fitted appear to be made from a specially selected grade of kerbstone and will usually burn anything that is offered up to them. For those who wish to save money here, a grinder is easily made. Many designs have been published in *M.E.* in the past including one by E. T. Westbury for which castings and drawings are still obtainable from Woking Precision Models of Edinburgh. This machine is equipped with a grinding disc and table at one end (an invaluable feature for the model engineer) and a grinding wheel with good adjustable rests at the other. Nowadays one would use a Vee belt instead of the flat belt which, I think, was specified, and couple up to a suitable second-hand motor obtained from one of the advertisers in *M.E.* I have made a rather more elaborate ball-bearing machine having means for grinding all tool angles with precision and I have promised to write this up for *M.E.* — if I live long enough!

The next requirement is a drilling machine and if money is available there are plenty to choose from — mostly of ½ in. capacity. If it is desired to economise then a small machine of ¼ in. capacity, which will handle about 99 per cent of a model-maker's drilling needs, can be made at very little cost. There are at least three or four firms who supply sets of castings for such a machine which can be made with the equipment already available. Not only will this course save money but it will provide excellent practice in using the tools. Even if a larger machine is bought at a later date, a well-made ¼ in. machine will still be the preferred one for nearly all model work. Many of the ungeared machines with a rated capacity of ½ in. really run too fast for this size of drill (and useless for reaming) and the top speeds are rarely fast enough for very small drills in addition to which they are less sensitive in use. In my own shop I have a ¼ in. capacity machine ("Champion" with mods.; speeds up to 4500; cost £8 in 1946) and a ¾ in. capacity geared head pillar drill (spds. 45 to 2600) which drills fewer than 1 per cent of the holes needed in model work but it is useful for drilling, reaming and spot-facing the larger holes encountered in tool-making which, in the absence of

this machine, would be done in the lathe.

With the exception of heating means for hardening and silver-soldering (Propane is probably the best) we have covered practically everything necessary for the model engineer's workshop and so my final remarks will be concerned with "frills". At one time shapers were much used in the amateur's workshop but their popularity has diminished, their place having been taken by the small milling machine which might be either horizontal or vertical. The plain horizontal machine is of very limited use but when fitted with a fully swivelling vertical head is probably the ideal. After this comes the vertical which is the type most favoured by amateurs. A very useful accessory for the vertical miller is a small dividing-head to fit the table slots and having the spindle nose screwed to take the lathe chucks; mine is more or less permanently fitted with a 4 in. lever scroll chuck which has much less overhang than the key-operated form. As I have already stated, a great deal of milling work can be done in the lathe with the aid of a vertical slide, but the scope can be further increased by the use of a suitable milling attachment driven from an overhead gear or a built-in motor drive. The late J. A. Radford described in detail a very fine milling attachment with motor drive which was built on his Super-7 lathe (*Model Engineer* vol. 133 - 1967). For those who would like to make a vertical milling machine there are castings or complete kits available from regular advertisers in *M.E.*

A bandsaw is a very useful machine for the model engineer provided it is capable of cutting mild steel efficiently, which some of the smaller ones on offer will not; the speeds are too high and, owing to the small size of the pulleys, the saws frequently fail from fatigue. I, and now several of my friends, have fitted up excellent machines which are based on the Myford woodworking bandsaw attachment driven through a worm-reduction gear bought on the surplus market. With this I have cut ½ in. MS plate (with the greatest of ease) down to .008 in. brass shimstock. How else, apart from a 4 in. guillotine, could one cut a strip 9 in. wide from a 4 ft. x 2 ft. sheet of 18 SWG brass in a couple of minutes with no distortion?

For those, like myself, in the sere and yellow or those, again like myself, who are allergic to hard physical work, I would put a small power hacksaw high on the priority list. There is the little Kennedy (now costing much more than mine did) or a set of partly machined castings for a really excellent machine designed by Mr. A. E. Bowyer-Lowe obtainable from Messrs. E. W. Cowell of Watford who can supply castings also for other pieces of workshop equipment.

There is a great deal more that could be written about the fitting out of a workshop — heating, lighting, the stowage of tools and materials — but I must stop somewhere so I will end with a few more words of advice to the beginner. Many Model Engineering Societies hold "rummage sales" at their regular meetings where tools, sundries and surplus materials can be picked up very cheaply and there are frequently very good bargains to be obtained from the dealers selling surplus tools, but remember also that a lot of manufacturer's rejects — often quite worthless — are also disposed of as "surplus". NEVER buy inferior tools; they are a waste of money. Get a small supply of SHELL Ensis oil (SAE 30) (which contains a rust inhibitor). A wipe with a rag impregnated with this will protect your tools. DON'T keep your small drills and taps, etc., jumbled together in tins; stow them in wooden blocks (preferably beech or mahogany — NOT oak) suitably drilled to hold them.

And finally, get started and good luck!

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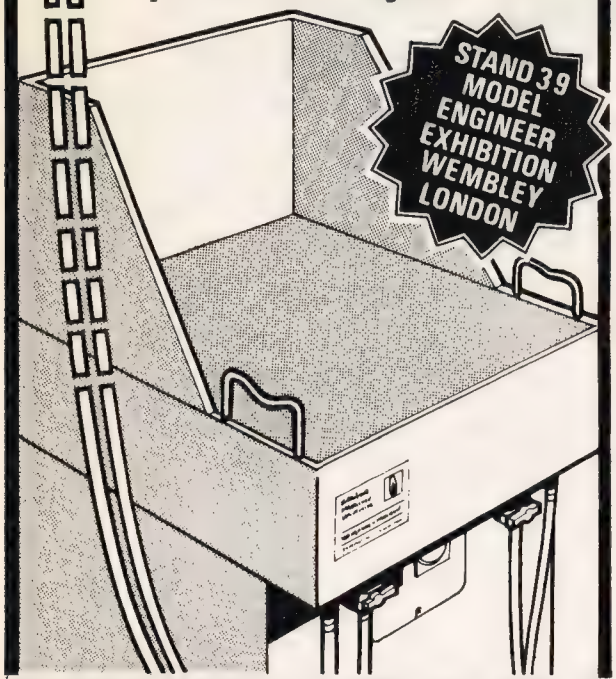

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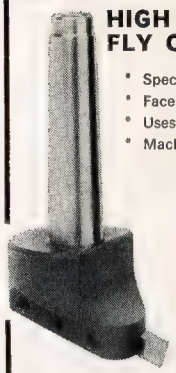

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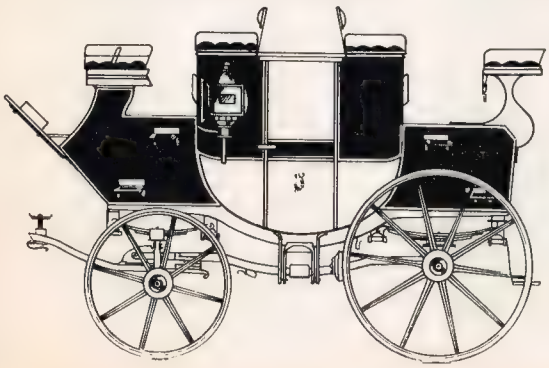

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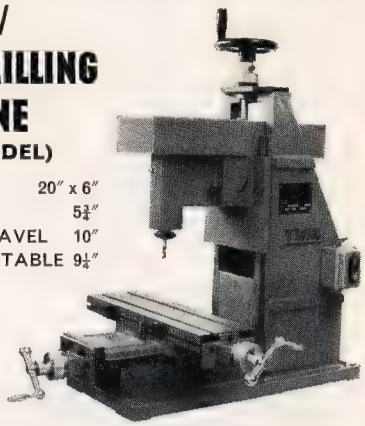

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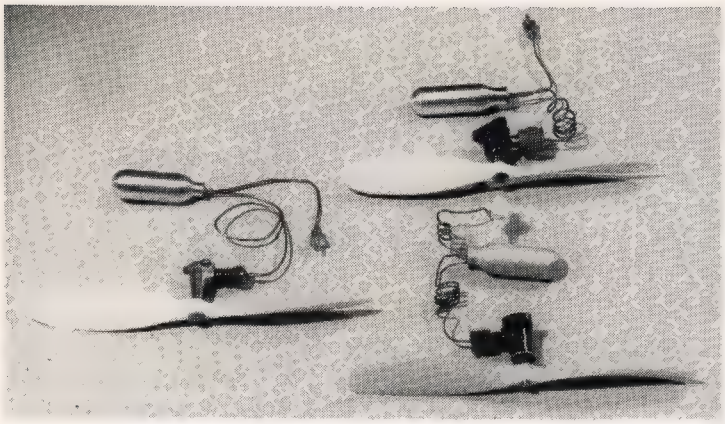


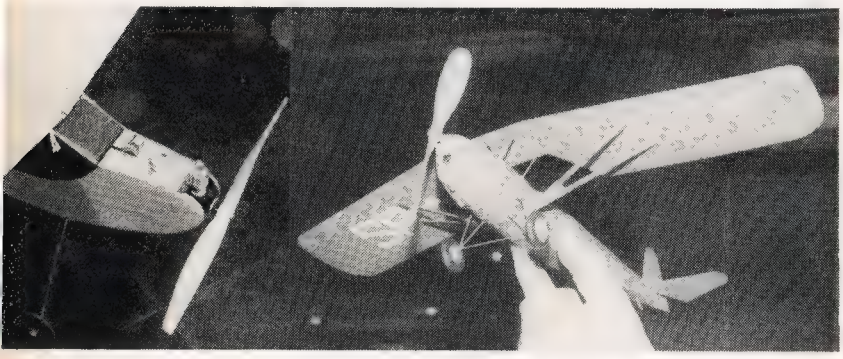
CO_2 POWER

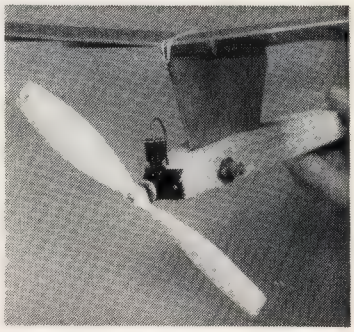
PETER RICHARDSON, EDITOR OF AEROMODELLER, DISCUSSES THE REVIVAL OF THIS TYPE OF MOTOR

ASK any recently-lost recruit to the sport of aeromodelling just why he has decided to "call it a day" and the chances are that he will blame the operational difficulties of the miniature internal combustion engines that are used. These "operational difficulties" can include not only the usual obstacle of starting and adjusting the device — whether glow plug or diesel — but also today, with public awareness and noise sensitivity at its peak, the decibel output can prove an almost insurmountable handicap in an urban neighbourhood. In truth these objections are not entirely valid — modern model aircraft engines are reliable and easy to handle *when you know how*, and the noise problem is now being tackled successfully by the manufacturers. However, all too often the newcomer blames everyone but himself . . . and another modeller is lost.

How can these problems be overcome? Well, electric power is one solution that has been growing in popularity in recent years, but there is an alternative — gas engines, normally referred to as CO_2 engines, as they operate on pressurised carbon dioxide. The idea is not new — more than 40 years ago there were CO_2 engines available, but these were eclipsed by the introduction of miniature internal combustion engines, and went out of production. Over the last few years, however, the American Brown Engineering Company re-introduced the idea and produced the Brown Junior — a superbly made item with a capacity of just 0.08 cc. More recently, the British-made *Telco* unit has made a welcome appearance on the market, and any time now the long-awaited *Humbrol PMS-1* engine will be in the shops.

The principle behind the operation of each of these engines is the same — and very simple too. The motor itself resembles a conventional two-stroke engine, except that there is no carburettor. Instead a thin copper pipe leads from the cylinder head to a small metal "fuel" tank, while a second copper pipe leads from this tank to a one-way valve. Inside the motor, the chief differences are that there is a spigot protruding from the centre of the piston, whilst the cylinder head contains a bearing ball within a chamber, the base of which has a hole passing through into the "combustion chamber" — this hole being sealed by the aforementioned bearing ball — see *Figure 1* for details.





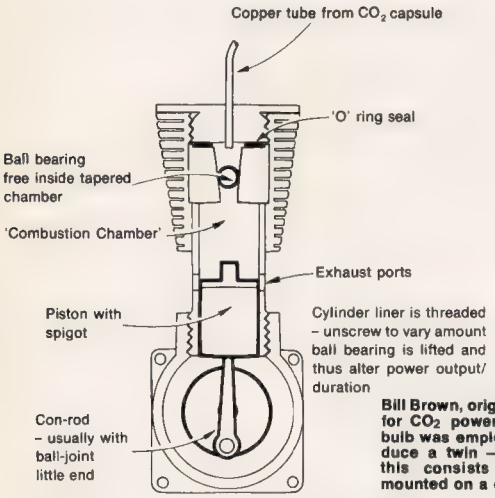
Heading picture illustrates the three CO_2 motors currently in production. At left is the Brown Junior — first of the "new crop" by several years, while top right is the newest recruit, the Humbrol PMS-1, with the Telco beneath it. Above is seen a Telco motor neatly installed in a contest-type model — the CO_2 "tank" is hidden inside the pylon which carries the wing.

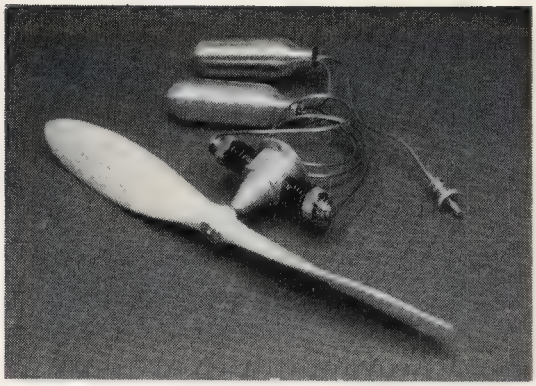
To operate, the "fuel tank" is filled with carbon dioxide gas under pressure via the one-way valve. The source of supply for this gas is readily obtainable in the form of *Sparklet* bulbs, as used in soda syphons — these "bulbs" must be fitted into special "loading guns" in order to inject the gas into the valve.

The pressurised gas flows down the copper tube to the engine's cylinder head and "blows" the bearing ball down against its seating, which then prevents the gas from reaching the piston.

To start the engine, the propeller is merely revolved — this causes the piston to rise and its spigot to displace the ball, which in turn allows the pressurised gas to flow into the "combustion chamber" and push the piston downwards vigorously. Thus there is no "explosion" as with a conventional

Typical installation of a CO_2 motor within a sports-type free flight model seen at far left — note the filler valve protruding from the top of the fuselage and the coiled copper tube leading from the "reservoir" to the cylinder head. At left is seen a superb scale model of an RWD-8. This 15 in. span model has a Brown Junior hidden away inside.


Copper tube from CO_2 capsule
'O' ring seal
Ball bearing free inside tapered chamber
'Combustion Chamber'
Exhaust ports
Piston with spigot
Cylinder liner is threaded – unscrew to vary amount ball bearing is lifted and thus alter power output/ duration
Con-rod – usually with ball-joint little end



Bill Brown, originator of the re-fillable capsule for CO_2 power (until 1948 a whole Sparklet bulb was employed) was also the first to produce a twin — as seen above. Essentially this consists of two "Junior" cylinders mounted on a common crankcase.

two-stroke, as there is no form of ignition, but nonetheless, the piston descends rapidly. As the piston descends the bearing ball re-seats itself due to the incoming gas, and this action cuts off the gas supply to the piston. When the piston reaches the bottom of its stroke, the exhaust ports are uncovered, allowing the gas which provided the downward force to escape. With this restriction now absent the piston returns to the top of its stroke, dislodges the ball once again admitting more gas — and so the process is repeated.

In order to vary the power output, there is only one practical solution, and that is to alter the volume of gas entering the engine. In the *Brown Junior* and *Humbrol PMS-1* engines, this is achieved by screwing or unscrewing the cylinder into the crankcase (thus altering the volume above the piston but, more importantly, changing the lift time on the ball) whilst the *Telco* differs in that the crankshaft is housed in an eccentric bearing: revolving the bearing thus alters the height of the piston in the engine — and the power output.

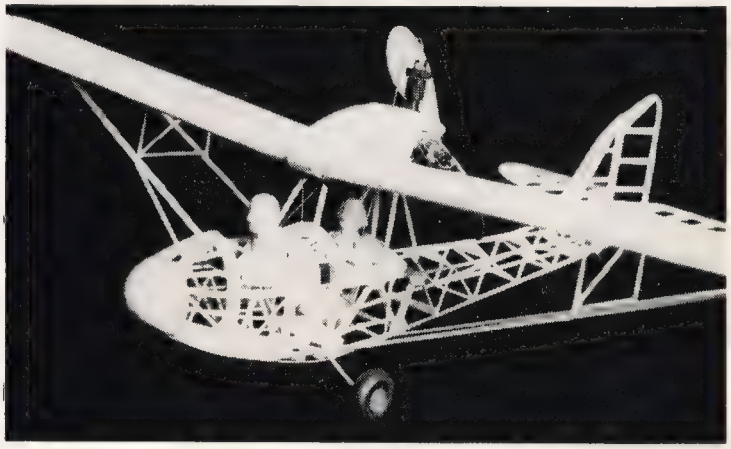
Power may thus be adjusted to suit the needs of the operator — one can choose between low output for a long duration or high output for a short duration, from the fixed capacity of the gas tank reservoir.

So what are the advantages? Firstly, as there is no "explosion", there is virtually no noise. As no heat is generated — other than friction — the main body of the engine can be made in nylon or plastic, with its associated large production advantages, if desired. Furthermore, note that to start the operation cycle the propeller only has to be *pushed* — there is no question of the motor not starting, bar any malfunctioning parts. The motor will operate in either direction quite happily.

Finally, these motors must be just about the most economical to operate — around seven "fills" can be achieved from a single *Sparklet* bulb, and a box of ten costs approximately 90p. Compare that with the current cost of diesel or glow fuels, and the consumption figures for those engines . . .

So those are the advantages, but unfortunately nothing is perfect. The major drawback concerns the maximum practical capacities of these engines — about 0.1 cc! Why so small? Remember that a cylinder of gas must be carried in the model — and a bigger engine will consume much more gas, requiring an enormous "tank". That means greatly increased weight — and operating costs.

At present, the engines available will operate from 10 to 70 seconds on a single tank of gas depending on the amount of power required, as previously described. Being small they are light — the total airborne installation weight is in the region of ½ oz. — and thus they are ideal for powering small free-flight models of up to approximately 25 in. wing span. Many models designed for rubber power are eminently suitable for conversion, as are numerous small scale kit models. In fact, with a little imagination, there is tremendous scope for fun flying with these engines. With their easy starting, safe (i.e. non-toxic) operation, they are also ideally suited for youngsters — and the price of the British-made units is most attractive at around £9 complete for engine/tank unit, charging "gun" and *Sparklet* bulb. Unfortunately, the American unit suffers greatly from the poor dollar/pound sterling exchange rate, together with a limited production capacity, and retails at approximately three times this figure, when available.



David Deadman has neatly hidden the Telco engine in his 22 in. span version of the Curtiss Junior by camouflaging it as one of the three cylinders of the full size. A further advantage of CO_2 engines is that they will operate in both clockwise and anti-clockwise directions — a very useful feature for "pusher" aircraft such as this.

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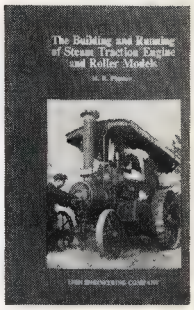

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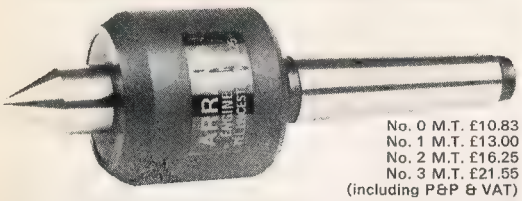

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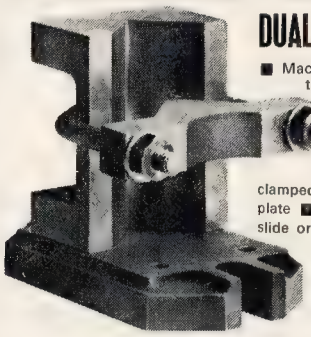

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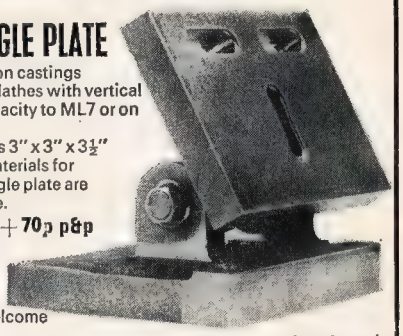

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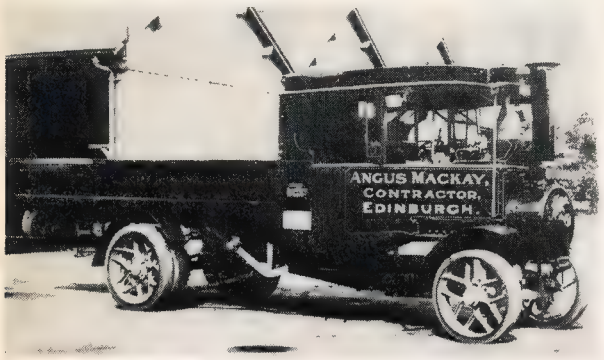

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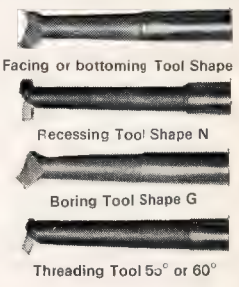

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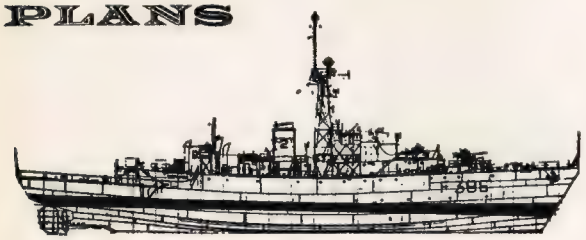

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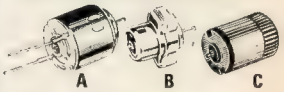

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A Year of Plastics

By Ray Rimell, Editor of 'Scale Models'

ANYONE who believed this time last year that plastic kit development had reached its zenith will, by now, have realised their assumption was premature. The past year and the early weeks of 1977 have seen even greater advance in kit design than ever before. With an increasing number of new brands, ranges and series flooding the market almost weekly, one would be forgiven for thinking saturation point was nigh. But this is just not so.

The level of sophistication may seem to have been reached already, but there will always be room for bigger and better kits, and nowhere is this more evident than in the aircraft field. Plastic aircraft modellers are still one of the most well catered for by the plastics manufacturers and there's even a specialist magazine devoted solely to the subject.

Nevertheless, while such aircraft kits abound, there are drawbacks. Over-enthusiasm for a new type of aircraft subject often results in several manufacturers producing kits of it all at once. The General Dynamics F-16 fighter, for example, has been kitted in various sizes by at least *five* manufacturers — and there are more on the way! Thus, the modeller is faced with a difficult decision and he, or she, must rely, to some extent, on the reviews in commercial magazines and perhaps, ultimately the depths of his/her pocket.

If 1976 was notable for anything, it would be for the return of 1/48 scale aircraft as manufacturers realised that ever-increasing prices would force the really large scale kits into the minority. 1/32 scale seems to be on the way out, with 1/24 remaining almost a monopoly with one leading UK manufacturer. 1/72 scale is the most popular, although the trend is still to release well-tried favourites rather than break into pastures new. So yet again, Messerschmitts, Spitfires and B-17s figure highly in this year's new releases.

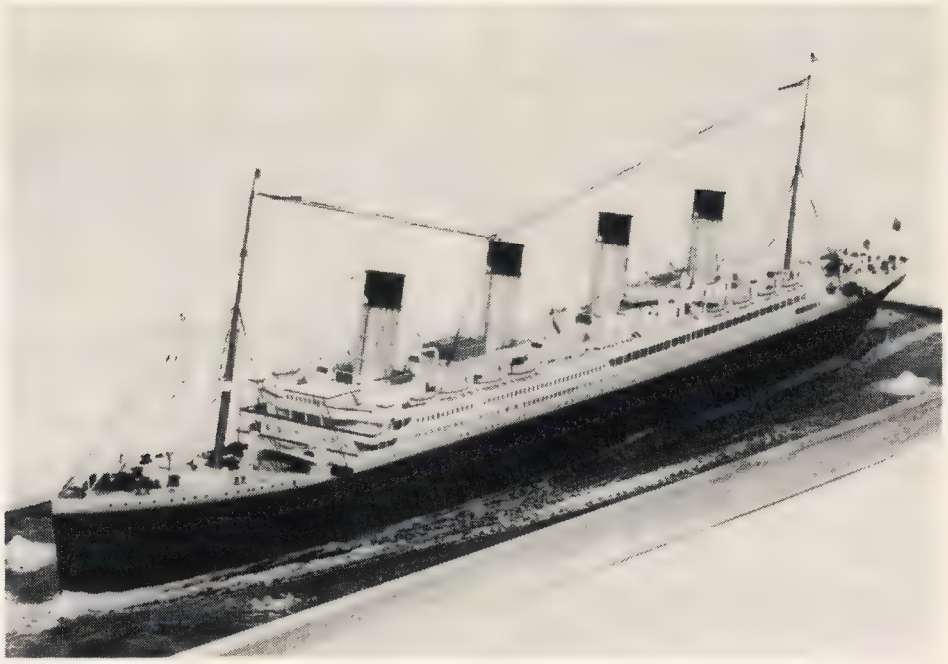
Thank heavens for the vac-formed kit, which, as it lends itself to comparatively economic production, results in more esoteric subjects being introduced. Very much a "cottage industry", vac-form kits arrive as

Top: An exciting model of the *Hindenburg* by the American AMT company (model R. Rimell).

Above, left: One of the many General Dynamics F-16 kits on the market; this one is 1/72 scale from Revell (model G. Prentice).

Left: Increasingly popular are heavy vehicles such as this Gravel Trailer on a Mack DM800 truck, kitted by Ertl (model by E. G. T. Taylor).

The Entex *Titanic* kit is 1/350 scale, nearly three feet long (model by R. Rimell).



Below: Just part of the interior detail of the Airfix 1/24 scale Junkers Ju 87b *Stuka* (model S. Archibald).

one or more sheets of 20/30 thou. plastic with all the parts moulded thereon, and it is left to the modeller to cut these out, trim and assemble. Obviously these are aimed at the more expert modeller, who usually will have to find his own decals and smaller items, such as guns, wheels, etc.

1976 saw several new manufacturers of vac-form kits enter the lists and happily, two of these were of English origin. One produces exacting vac-formed biplanes with detail and accuracy on a par with any good quality injection moulded kit. Diecast engines and guns, "rubber" tyres and decals are also provided which puts this company into a class of its own.

The large 1/24 Stuka recently released by a leading manufacturer takes us back to our first paragraph; anyone looking at this kit will not believe it can be bettered — but wait and see what next year may bring!

What is left in the plastics field? Plenty. Cars and Military subjects continue to be popular and increase in quality and size. The large American Truck kits are one of the biggest selling lines in the industry and make spectacular subjects. Vintage and Formula 1 racing cars will always be popular and it's left mainly to the ever enthusiastic Japanese to provide some stunning examples of these subjects.

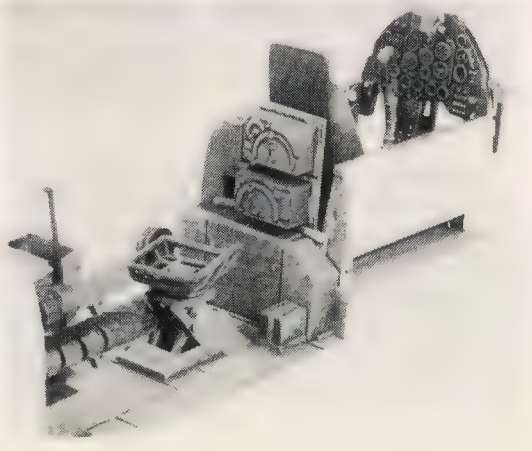
Ships and boats for some strange reason take a back seat where plastic kits are concerned. There were very few new releases announced last year and there seems to be little change now. This does seem hard to understand. Nothing can be more impressive than a miniature battleship bristling with guns or a sailing ship with full rigging. Yet these are not easy subjects to model, which may account for their comparatively low key presence in kit catalogues.

A leading French manufacturer produces some of the finest sailing ship kits to be found anywhere in the world while the Japanese consortium of four manufacturers produce a superb range of WW2 Japanese warships in 1/700 scale which are extremely popular, especially as British, American and German ships are now included in their ranges.

One of the past year's most successful releases was a mammoth kit of the ill-fated *Titanic* White Star liner — an incredible kit full of detail and providing the basis of a museum piece model. It has proved to be extremely popular with Anglo/American modellers, and with a *Lusitania* model to follow, the trade winds appear to be set a little more fair.

1976 saw the airship make inroads into plastic kit ranges, no doubt helped by publicity engendered by the *"Hindenburg"* film. Now, no less than five airship kits are freely available — before 1976 there were none — and range from a 38 in. long model of the *Graf Zeppelin* to a 11 in. diameter Civil War Balloon. Perhaps some manufacturers *are* seeking new grounds after all.

1977 may well hold even more surprises for plastic modellers — who will dare deny the possibility of a 1/48 scale B-29 Superfortress or a ¼ scale six-wheeler Tyrrell F1 car?



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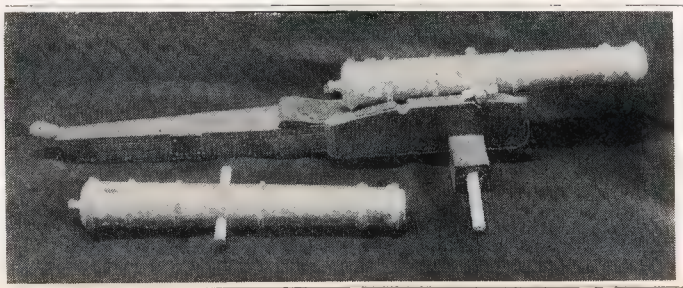

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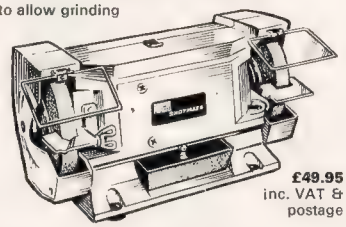

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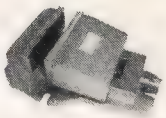

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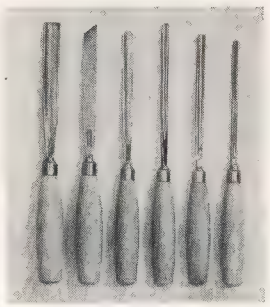

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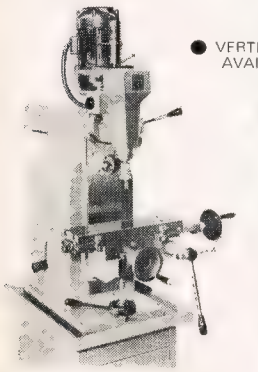

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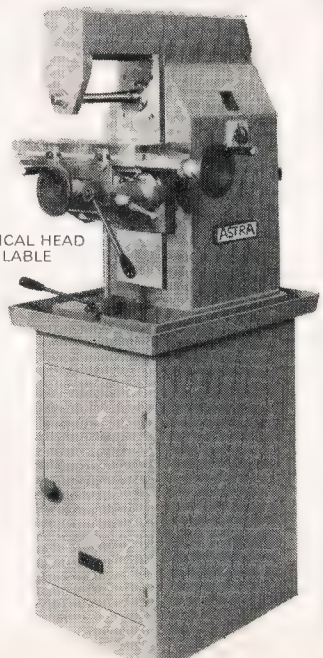

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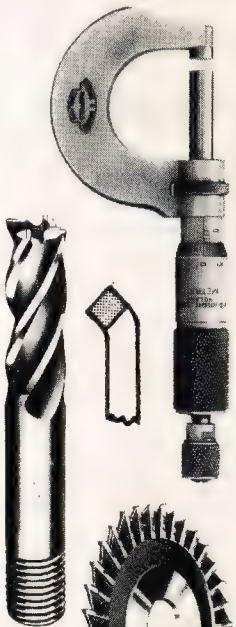

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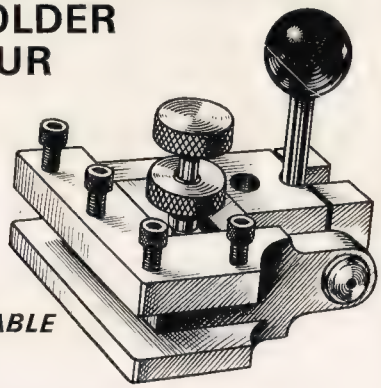

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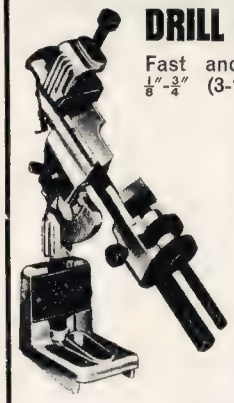

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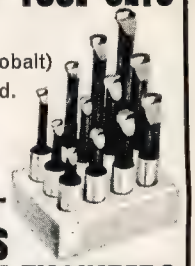

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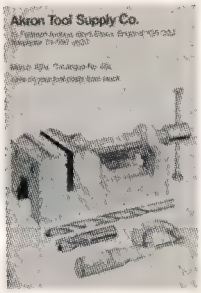

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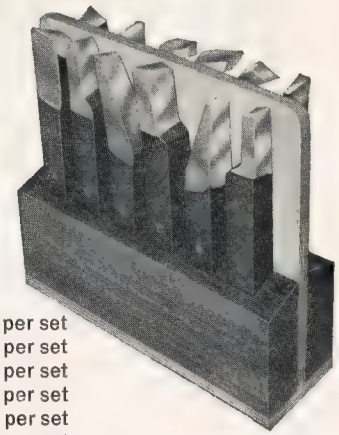

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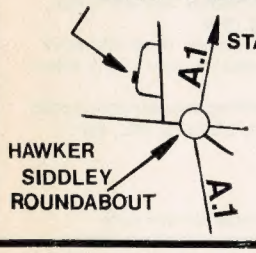

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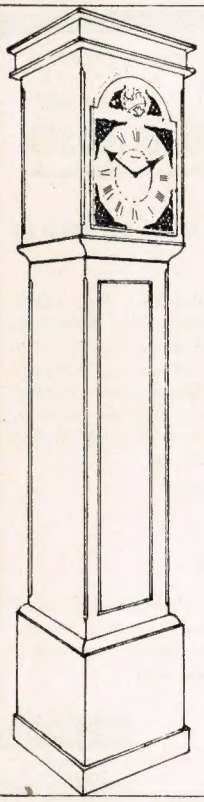

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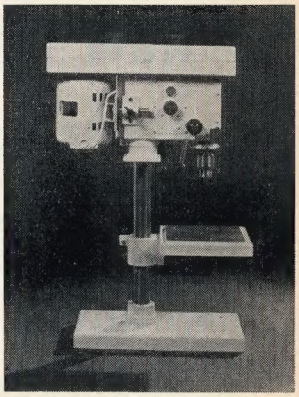

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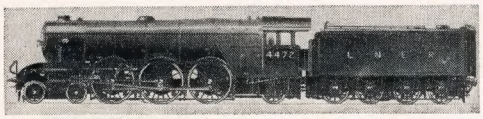

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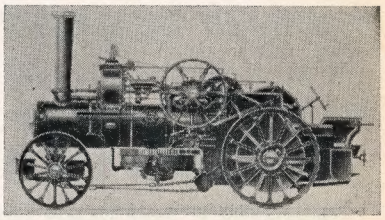

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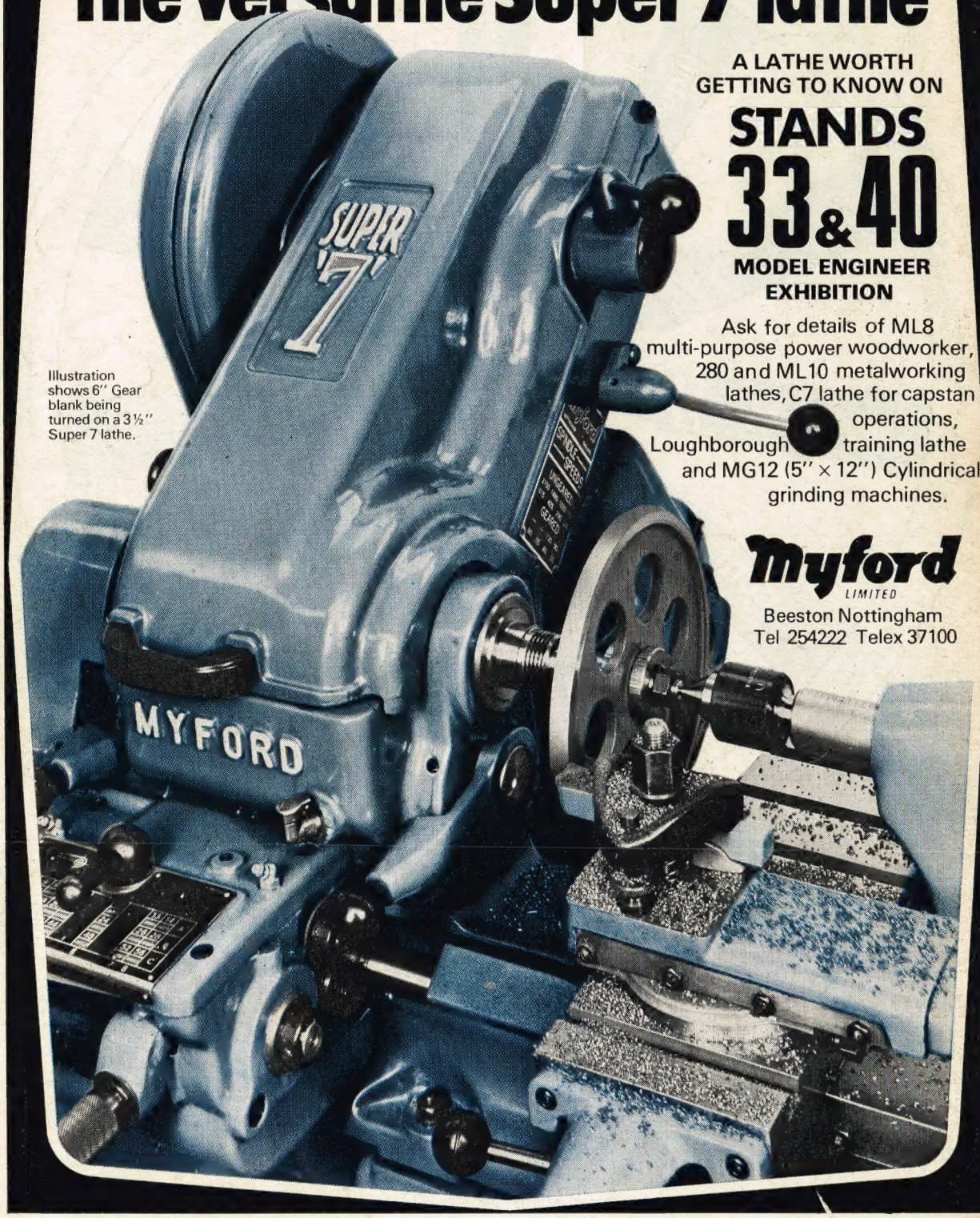

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